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to Volumes 5, 6 and 7

1940 - 1941 - 1942

Compiled by P. A. Gilbert, Hon. Editor

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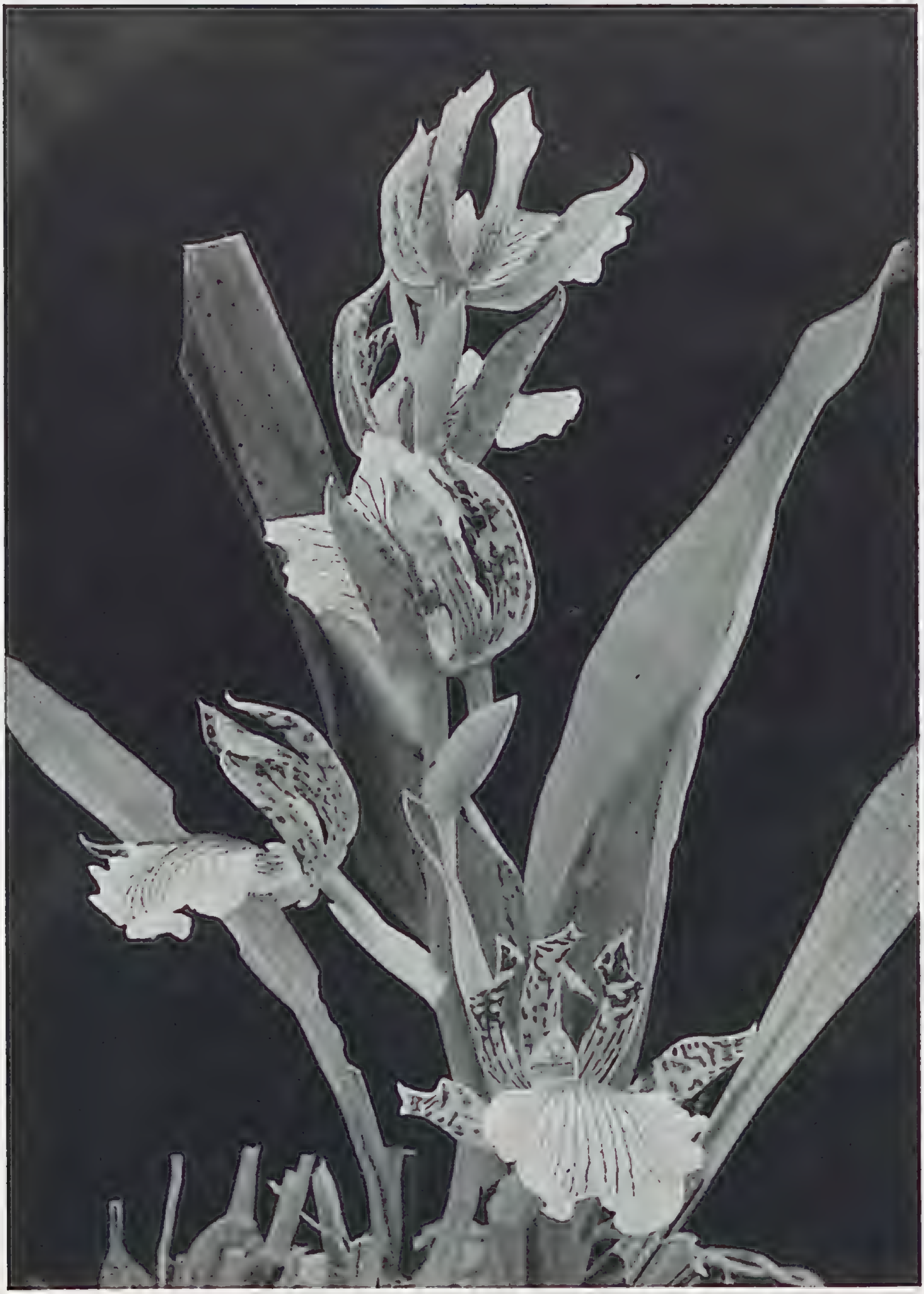


ZYGOPETALUM CRINITUM. Lodd.

Synonym, Eulophia crinita. A native of Brazil; flower up to 3 inches across, sepals and petals, pale green with brown stripes and blotches; labellum white with reddish or violet lines; perfumed; responds to intermediate or warm treatment; flowers late autumn to early spring. (Qld., N.S.W.).

Grown by J. Waltisbuhl. Photo by J. R. Bailey.

Australian Orchid Review

Editorial

The Orchid as a Symbol

● Man instinctively symbolizes his ceremonial actions with objects that are intimately connected with the purposes of his gatherings. Hence, from the aboriginal who has his fanciful and naturalistic totems, to the highly civilized European, with his numerous political, aesthetic and religious conceptions, symbolism seems to be the force that draws man into groups for specific forms of adoration. Nor is the Orchidologist free from the influence.

The Orchid Society of New South Wales has symbolized *Sarcochilus falcatus* by adopting it as its emblem; the Queensland Orchid Society is no less a symbolist in its selection of *Dendrobium Phalaenopsis*, its emblematic fervency exceeding that of the other Society by issuing badges in enamel which are sold to members to wear in their buttonholes. What an excellent idea! The badges act as symbols of recognition by introducing Orchid enthusiasts to each other in the throng.

The Orchid Circle of Ceylon adores its *Dendrobium MacCarthiae*, or "Wesak Orchid," that species being the emblem of the "Circle." It is also held in reverence by the natives, who use the flowers as offerings in the temples during their pilgrimages. Energetic steps have been taken to preserve the species, which is peculiar to Ceylon and where it is regarded as one of the national flowers.

In "Orchidologia Zeylanica" for September, 1939, the following paragraph appears, which is interesting enough to reiterate:—"When His Excellency Sir Andrew Caldecott recently inaugurated the Colombo Swimming Club he adopted the novel method of christening the new pool by casting an Orchid bloom into its waters. The Governor's choice of an Orchid for the purpose must have created a precedent for such ceremonies. The Orchid figures in emblematic roles in various parts of the world. It appears on the coat-of-arms of the State of Manchukuo, where the highest order of chivalry is the Imperial Order of the Orchid. It is the emblem of membership of one of the most exclusive political clubs in the world—the Chamberlain Club of London—which consists of only as many members as there are years since that famous patron of the Orchid, Joseph Chamberlain, launched his Tariff Reform Campaign in 1902. Every member of this club must be an adherent of Chamberlain's policy, and on admission to membership is presented by the President with an Orchid. *Lycaste Skinneri alba* has been chosen by the Government of Gautemala as the national flower of that republic. *Cattleya Skinneri* is featured in an attractive mauve and green postage stamp issued by Costa Rica."

An Orchid that has been practically deified is known as the Dove Plant, *Peristeria elata*, owing to the imaginative resemblance of the combined column and labellum to the form of a dove. It is a native of Panama, where the early Spanish settlers knew it by the name of "El Spirito Santo," flower of the Holy Ghost. History has it that the brutal Spanish desperados put unbounded faith in the supposed supernatural powers of this flower during their attempts to extirpate the Indians. On many occasions, however, they were repulsed.

Ansellia Africana, *Ldl.*

E. COOPER, *England*

Readers of the Australian Orchid Review will be delighted to hear from Mr. Cooper again, especially those who made his acquaintance during his sojourn here. Despite the fears of tedium expressed in the last paragraph, enthusiasts welcome advice and knowledge on little known species, both horticulturally and botanically.

● In the report of your Orchid meeting, held on August 31, 1939, kindly sent me by Mr. T. H. James, mention is made of *Ansellia Africana* as being among the plants exhibited. It is not included among the outstanding exhibits, hence this note, which I hope will be of interest, as *Ansellia Africana* should lend itself readily to acclimatization in Australia, and any of the typical or superior types would, I think, be appreciated. But there are *Ansellias* and *Ansellias*, and an endeavour to explain their difference, though an attempt only, may be of help.

First as to the genus as a whole. It was founded by Dr. Lindley on a dried specimen obtained in Fernando Po by Mr. Ansell, who accompanied the Niger Expedition of 1841-2.

The genus is exclusively African, being distributed very widely throughout that continent in the south, east and west. The general characters are cylindrical stem-like pseudo-bulbs, often of considerable height, the upper portion carrying strap-shaped leaves, which remain for a considerable time. The flower spikes are produced from the apices of the bulbs, and may be simple, branched, erect, or arching.

Comparatively, the flowers are of medium size. Over two inches may be considered a good diameter. In many cases the measurement is less than that. On the whole, the sepals and petals are subequal, somewhat oblong, more or less yellow, shaded with green, blotched and spotted with red-brown, the labellum being three lobed, the side lobes erect or nearly so, and of no great height. The midlobe, broadly oval, is usually brighter in colour than the other segments, and bears two or more keels, the margins of which may be slightly upturned, and the anterior portion somewhat plaited or folded.

The height of the pseudo-bulbs and floral characters are all indefinite, in that discrepancies occur in the different forms, yet connection can be traced.

The genus is said to be allied to *Cymbidium,* differing chiefly in the fact that the inflorescences are terminal. So far no *Cymbidiums* have been discovered in Africa proper, as far as I know, and it would seem as though *Ansellia* had taken their place. Madagascar contains *Cymbidiella,* closely allied to *Cymbidium,* but *Ansellias* seem absent from that island.

Confusion has existed almost from the founding of the genus. In Veitch's Orchid Manual, it is stated—"These *Ansellias* are very closely related to each other, but at present they could not be accepted as mere varieties of the original type." Sanders Orchid Guide (1927) states—"It is quite possible that all the known forms are but subvarieties of one or two species." With scanty material, it is difficult to make allowance for the differences caused by wide distribution, the adaptations necessitated by local climatic conditions, and the possibility of different fertilizing insects.

Quite recently, in 1938, a botanical revision of the genus has been given by Mr. V. S. Summerhayes, the Orchid authority at Kew, and his decision tends to confirm the hypothesis in the previous paragraph.

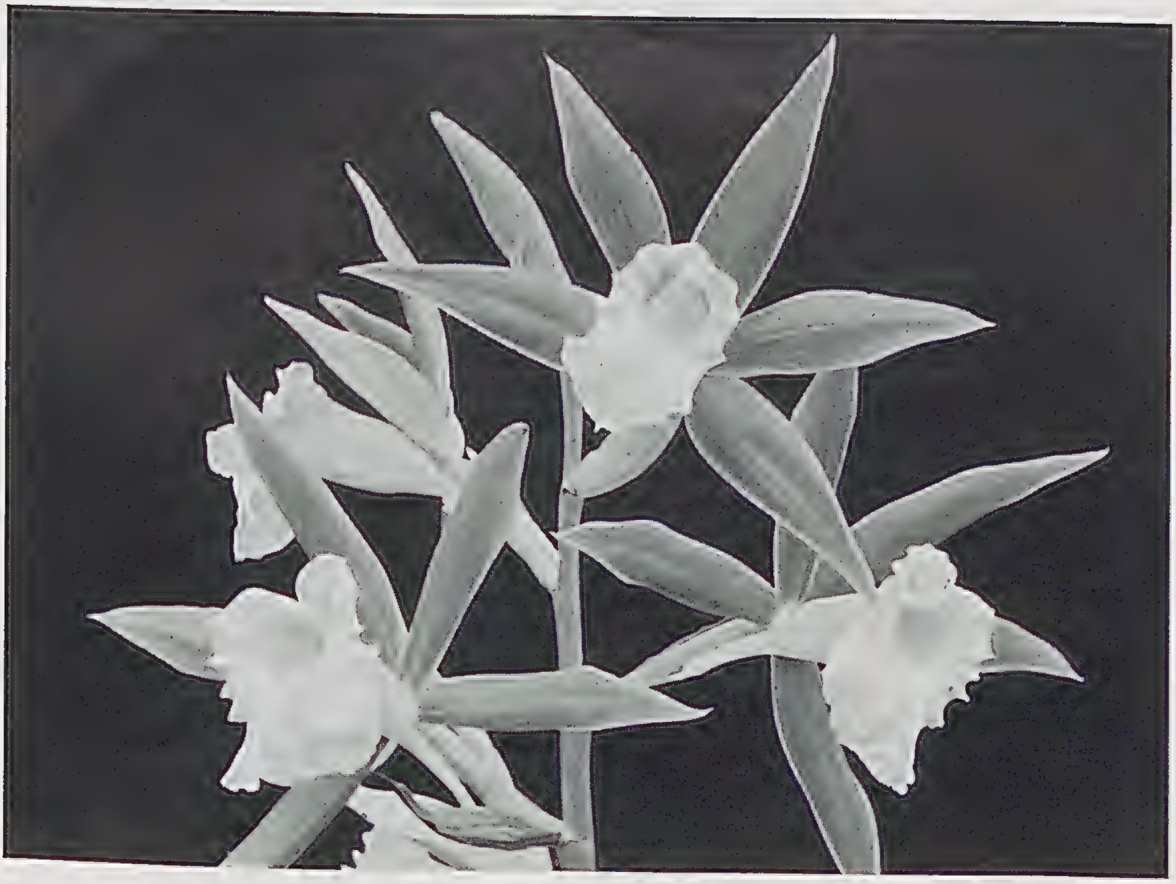
Some considerable time previous to 1938, a correspondent from Central Africa forwarded to Messrs. Sanders a number—over twenty—of dried specimens of complete inflorescences in good order, which were most interesting and illustrative. These were passed on to Kew and, in a conversation with Mr. Summerhayes, he expressed his pleasure at receiving them, as the comparison of such specimens collected in different localities, with the material already existing, would enable him to differentiate a number of species.

I hazarded an opinion that he would not find many species, but that the specimens would tend rather to reduce the number as my own (unconfirmed) opinion was that the genus was monotypic, and that all the so-called species were forms of one.

Under cultivation it has been very difficult to place odd plants which have flowered. Colour, lip shape, size, etc., have been at variance, but not to a marked degree.

Quoting from The Orchid Review of January, 1938, p. 4, the following note appears:—

"*Ansellias.* Hitherto we had come to regard *Ansellia nilotica* as a variety of *A. Africana,* but Mr. V. S. Summerhayes (Kew Bulletin No. 9, 1937) now tells us that he considers it to



PHAIUS WALLICHII, Ldl.

Widely distributed in Ceylon and India; flowers October-December (Qld., N.S.W.); flower 4 inches across. The illustration is of a fine variety, probably bi-color.

Grown by J. R. Tanner. Photo by J. R. Bailey.

be a variety of *A. gigantea.* In the Flora of Tropical Africa, R. A. Rolfe admitted five to the genus *Ansellia,* in addition to Reichenbach's South African *A. gigantea.* Mr. Summerhayes reduces these to two, *A. Africana* and *A. gigantea.* The Angola form of *A. Africana* is described as *A. Africana,* var. *australis,* and, as already noted, Baker's *A. Africana,* var. *nilotica,* becomes *A. gigantea* var. *nilotica.* But Mr. Summerhayes points out that the difference between type and variety are mostly those of degree, but the very considerable correlation between the various characters in the South African specimens justifies the separation of this form, which has to be taken as the nomenclatural type of this species. Taxonomically, since *Ansellia* is clearly mainly a tropical African genus, *A. gigantea* type may be regarded as a locally segregated race of the much more widely-spread and more variable variety *nilotica.* It would appear that *nilotica* ought to have been discovered and named before *gigantea,* so that the relations between the present type and variety might have been reversed."

So much for the botanical nomenclature of the genus—(details will be found in the Kew Bulletin mentioned)—interesting enough, I hope, to be read or printed, but of little value to the object of this note—the cultivation and possibly the acclimatization of *Ansellias* in Australia.

For that purpose the climate of the district or locality from which the plants have been collected is of far more importance than the correct nomenclature, as it is evident that a plant from Western or Tropical Africa would require a higher mean temperature than one from Natal. And where one might be grown out of doors in the Sydney district, another would require the higher temperature of Northern Australia.

It seems to me that the older classification will for this note be the more serviceable, so I am following that, giving as far as I can the slight differences between the types or sub-varieties which we knew, or previously tried to define, as species.

Africana has pseudo-bulbs 2 to 3 feet high, and, though very variable in all respects, is well worth growing, particularly if one of the better varieties can be secured. I have seen 170 blooms on a single branched spike, and, as there were two other spikes on the plant equal or nearly so, I congratulated the grower, and can still visualize the plant.

The West African forms naturally require more heat than those from the south, which are usually lighter in colour and less in habit, so much so as to be distinguished by the varietal name *lutea,* though the true *lutea* is more or less confined to Natal.

West Africa also gives *A. confusa,* distinguished from *Africana* by its taller but more slender pseudo-bulbs, its longer and narrower leaves, and usually slightly smaller flowers, similarly coloured to those of Africana—possibly no other Orchid genus exhibits such general coloration throughout.

Congoensis has its habitat conveyed by its name and, like *confusa,* revels in a moist warm atmosphere. The pseudo-bulbs are hardly as tall as those of *confusa,* but are of greater substance, though without the stiffness, somewhat characteristic of those of *Africana.* The spikes may carry up to 100 flowers, which possibly exhibit more divergence in colour than the other species, as the lip side lobes are flushed with pink, striped with purple and yellow edged, while the yellowish ground colour of the sepals and petals may be nearly obscured by red-brown blotches.

Nilotica, first discovered on the upper Nile, but with a considerably wider distribution, is, in certain forms and in some respects, the best of the genus. A few years ago several plants were shown under this name. Not unlike *Africana* in habit, but with shorter, more clavate pseudo-bulbs, though I do not think any of the plants could have produced the number of blooms cited on *Africana,* the individual flowers were superior in size and brightness of colour to any of the other forms. The plants were only some 15 inches in height, exclusive of the leaves, and so were handier for our glass-house conditions and space.

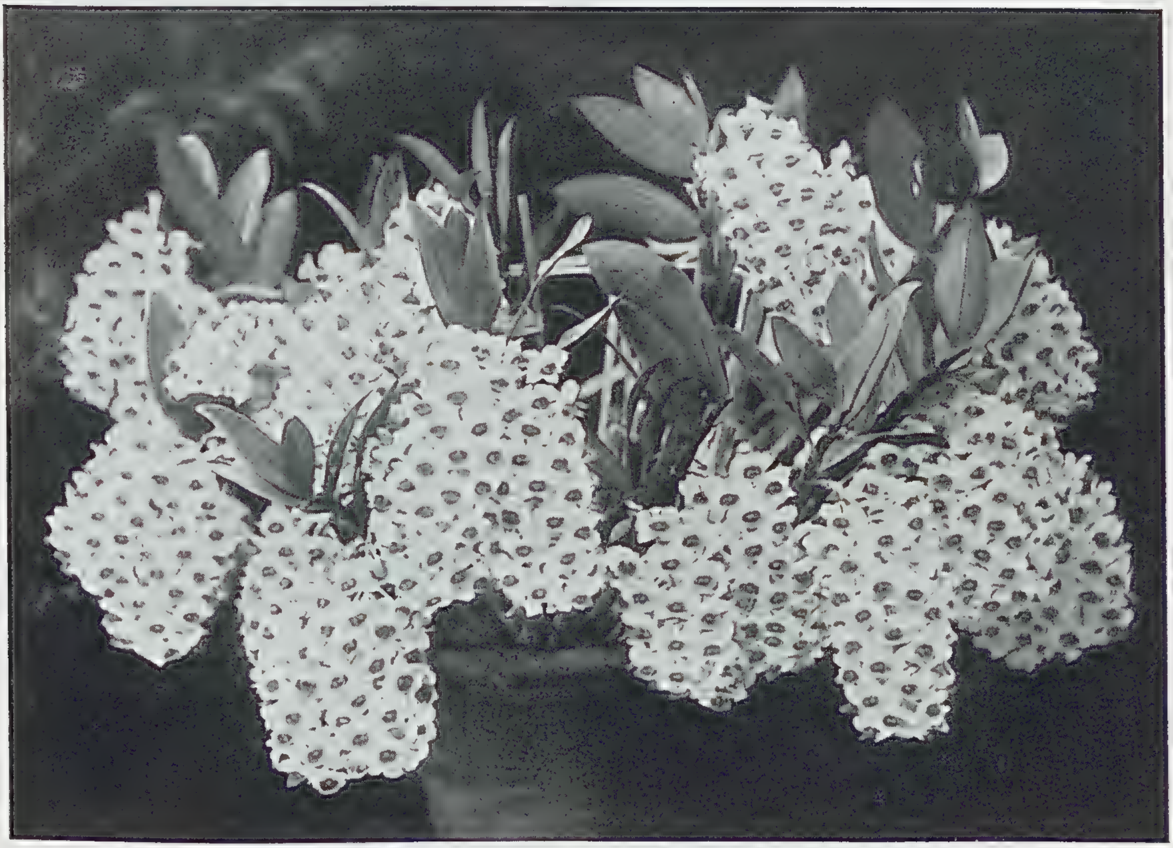
A. gigantea, from Natal and the southern part of Africa, has flowers paler in colour than those of *Africana,* the lip is more flattened and carries three distinct keels, in other respects it resembles *Africana. A. humilis,* which extends into the Zambesi district, has slightly longer flowers than those of *Africana,* and is paler in colour, but very variable in this respect. The pseudo-bulbs are usually set very closely together, and are slightly swollen centrally, but such characters cannot be taken as diagnostic.

Now as regards culture. Here a compost is given of three parts of osmunda fibre, one part of sphagnum moss, with an addition of opening material, broken pot sherds, etc. To the kinds other than *Congoensis* and *confusa,* fibrous loam is added and with careful watering apparently gives the plants more "food" than osmunda and moss alone. Practically all the forms produce numerous adventitious roots, which extend above the surface of the compost, but this trait appears to vary in individual plants.

When the pseudo-bulb is completed *Africana, gigantea* and *humilis* benefit by a slightly lowered temperature in winter with infrequent watering, following exposure to light in the autumn. Care must be taken to keep the syringe or water from the young growths, as if water lodges in these they have an unpleasant habit of developing a central growth rot.

As regards culture in Australia, I think the compost given *Cymbidiums* there would suit *Ansellias,* but I would suggest that, at any rate, with freshly imported plants, small pots or tubs be used. In the Sydney district the warmer growing kinds would certainly require the protection of glass, and I think a moderate amount of pipe heat in the winter—about that given *Cattleyas,* although below the winter temperature given here, your sunnier days should compensate.

The Southern African forms would possibly succeed out of doors in districts where the thermometer remains above the first line, or protection can be given, but I think such protection should be of glass; the bush house would allow too much water and moisture on the plants, I fear. The *Ansellias* as a whole seem to be more strictly epiphytal than *Cymbidiums,* in fact in certain districts I have heard that



DENDROBIUM THYRSIFLORUM (See below)
Photo by E. A. Hamilton. Grown by Mrs. Needham.

they will grow on dead, leafless trees, exposed to full sunlight, but this does not apply to the western forms.

I am afraid this note will be found rather tedious, but if it will lead to other species, not only *Ansellias*, being grown, fresh interest would be aroused once their characteristics are shown and, from even the little I saw of your wonderful country, I do not think its possibilities as regards Orchids are yet fully understood.

● I have received some beautiful specimens of *Calochilus grandiflorus* from Burleigh Heads. I described the species in 1934. It is a really fine thing, and worth trying to grow. The flowers in some cases are 2½ inches long. It may or may not be identical with Bentham's *C. campestris* var. *grandiflorus;* but quite definitely this flower cannot be reconciled with Bentham's own description of *C. campestris.*
—H.M.R.R., 3/1/1940.

Dendrobium Thyrsiflorum

● The plant of *D. thyrsiflorum,* a photograph of which appears above, was grown by Mrs. Needham, of 54 Shirley Road, Roseville. It is a fine, vigorous plant in a 9-inch pot and has been imported three years. It is evenly grown all round the pot, the photograph showing one side only. There were 43 racemes out in flower when the photograph was taken.

It was grown in a bush house with a tea-tree roof and glassed in on the southern side. The house contains rough cast cement fish ponds. *D. Wardianum* and other *Dendrobiums* were making fine growths and showing plenty of bloom.—E. A. Hamilton, 20/12/'39.

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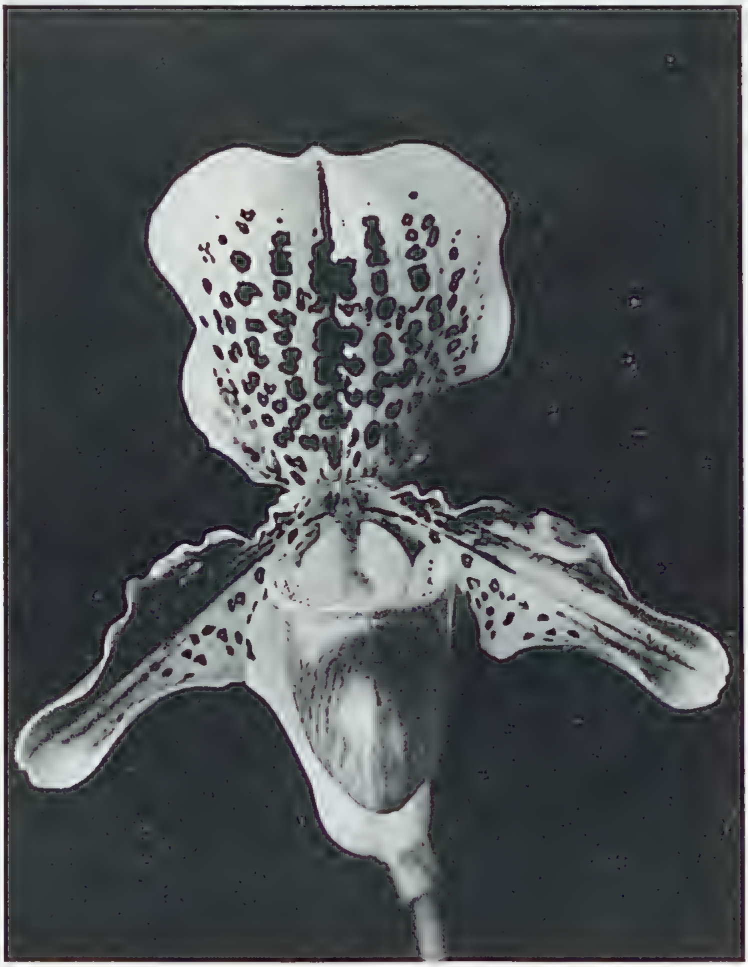
Notes on Cultivation of Cypripediums

HAROLD F. LOWER, *Highgate, S.A.*

● The longer I grow Orchids, the more I have it forced on me that their successful culture depends, not on composts, methods of watering, or similar details, but on two more important factors which are needed to make a success of anything worthwhile in life — namely, the utmost use of the intelligence with which each of us is endowed, and never-ending perseverance. Too many hope to achieve results by copying the other fellow, or following directions in a book or periodical written for conditions totally at variance with ours. The truth is that conditions vary tremendously and the only hope of ultimate success lies in the studying of our own climatic conditions, and then modifying these correspondingly. By doing so we will be working scientifically and will feel that glow of pride which comes from the success of our own work.

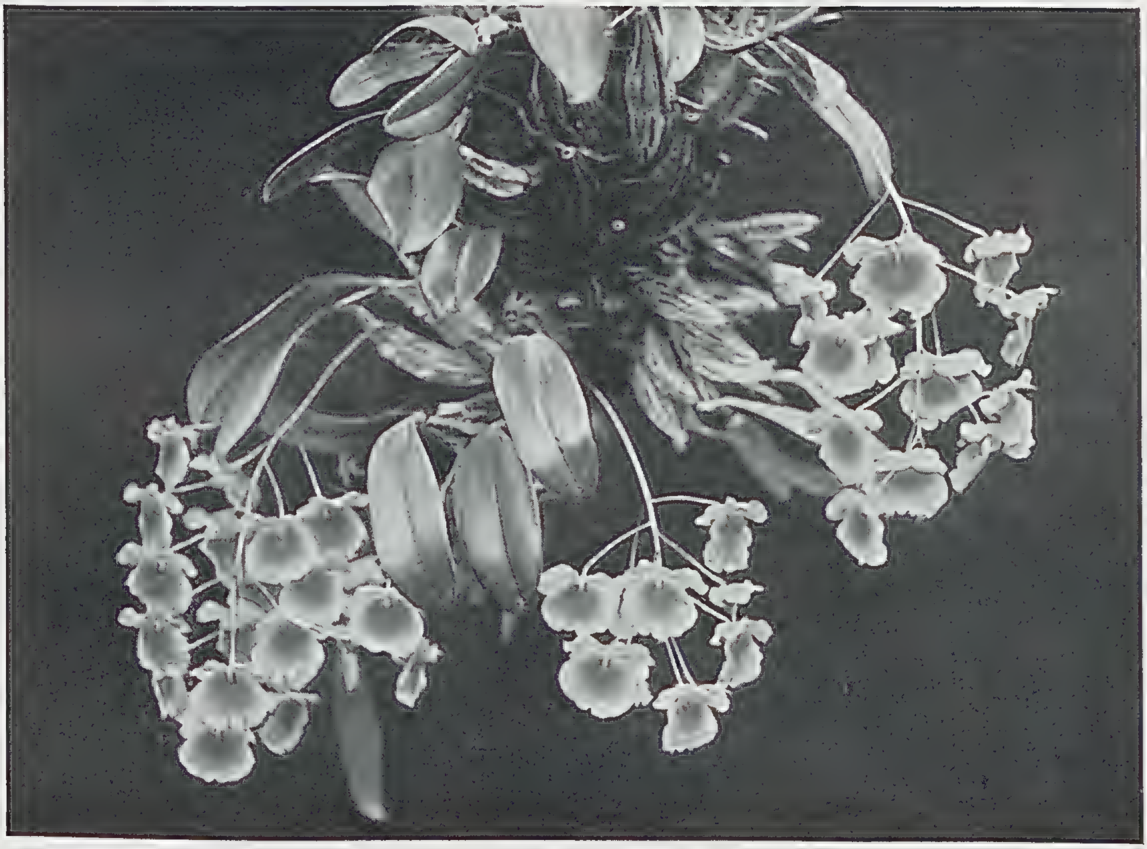
Successful cultivation of Orchids in the neighbourhood of Adelaide must, then, like charity, begin at home, and a brief resumé of our general climatic conditions will therefore serve as a guide to what modifications we must introduce, in order to approximate these conditions to those under which the plants naturally grow, thus removing many difficulties.



CYPRIPEDIUM JULIET
A hybrid with an intricate parentage in which C. Boxalli predominates.
Grown by C. Harveyson. Photo by Dorothy Coleman.

Briefly, our general climatic conditions are as follow:—From September to March we have a period of nearly continuous warmth, the shade readings during December, January and February often exceeding 100 deg. F., while at the same time the relative humidity varies from low to very low — on many days being less than 10 per cent., while a reading as high as 40 per cent. is comparatively rare. During this period the light is intense, while very little rain falls. Most of this is monsoonal in nature and, being accompanied by high temperatures and relative humidities, is beneficial. True, there are occasional cool breaks of a few days, but I find these far from affecting Orchids adversely, rather helping them to recuperate from the effects of what would otherwise be a too constant high temperature. Besides, these breaks are only relatively cool—since last August until now (January) the minimum daily temperature of my house has only been below 70 deg. on two days, one being 69 deg. and the other 68 deg. F.

April and May are intermediate in character, though more generally warm and dry, than



DENDROBIUM AGGREGATUM, Roxb.

Habitat from Burma to Yunnan; flowers (usually) September to November (Sydney). Colour of flower orange-yellow with darker patch in labellum.

Grown by Judge Markell. Photo. by E. A. Hamilton.

they are cold and wet. The real cold season is short, lasting from June to August. There are still many sunny days, but humidity is higher and temperatures are lower, readings below freezing point being occasionally registered on some of the nights in July and August. Thus, we have a long hotter and drier season than any *Cypripediums* are accustomed to, and a short cold season, colder than that to which some of them are habituated.

Having now set out the local conditions, it will be as well to turn to those which prevail where *Cypripediums* naturally grow. I am excluding from this discussion the American subgenera, as most *Cypripediums* cultivated here are either Asiatic species, or hybrids derived from them.

What may be termed the *Cypripedium* zone of Asia covers a huge area stretching from Siberia, China and Japan, through Formosa, the Philippines, New Guinea, the East Indies, Siam and Burma to India. In this vast area almost every variation of climate exists. In some parts of India and the East Indies, there is perpetual warmth—the annual or daily range of temperature being only a few degrees, with an almost daily rainfall. In others, as in large parts of India, and more so in Southern China, there occur regular periods of torrential rain, followed by a drier season, though the temperature is always fairly high. In Japan and Northern China there is a hot, wet season, followed by a shorter cold season, often with snow on the ground. Differences of elevation introduce further climatic variations, and these must always be borne in mind. For instance, *Cypripedium venustum* and *Cypripedium elegans* both come from India, but *C. venustum* is not found above 4000 feet, so can be easily grown under our conditions, while *C. Elegans* is not found below 10,000 feet and would need to be grown here in a refrigerator.

Consideration of habitats show that, generally speaking, *Cypripediums* are at least as much epiphytic as terrestrial. The three examples which follow have been selected with a view to variety, but they illustrate, as almost any other species does, the epiphytic tendencies of the plants.

C. Lowii.—Epiphytic, the roots running all over the bark, entering crevices where dead leaves collect and moss grows; subject to three or four hours of drenching rain almost daily. Constant high temperatures, rarely under 70 deg. F. day or night. Grows in shade, receiving no direct sunlight.

C. Charlesworthii.—Between 4000 and 6000 feet elevation. Strongest plants grow on bare limestone rock, roots entering crevices where a small amount of soil (chiefly weathered limestone) has collected. Rainfall high for a large part of the year, though a short dry season occurs, when temperatures occasionally fall to the fifties. Receives constant broken sunlight through rather open leaves of trees.

C. Venustum.—Frequents the densely-shaded valleys of Sikkim (India) up to 3000 to 4000 feet, growing often in a dim light and, under fairly warm conditions with constant moisture, in a light red sandy loam surrounded by other dwarf leafy herbage, around the moist lower stems of which, close to or on the ground, most of the roots wander.

We have now some ideas as to what conditions we are going to try to reproduce, and the factors concerned are composts, moisture, ventilation, light and heat. I intend to deal with each of these in turn.

Composts.—I have tried to approximate my composts to the substances on which the plants grow naturally, that is, to keep them epiphytic while at the same time providing a better food supply than I do for the purely epiphytic genera. My own *Cypripediums* are grown in the following mixture: fibre, 2 parts; sphagnum, 1 part; bracken root, which is fibrous, but holds a certain amount of loam tenaciously, 1 part; and broken crocks and charcoal, 1 part. For the lime-loving section, I reduce the charcoal, eliminate the crocks and substitute broken limestone.

This gives a light, open mixture which, while providing extra food, drains quickly and keeps sweet. I use as small a pot as the plant will go into without unduly cramping the roots, as it drains more quickly and therefore allows of more frequent watering without waterlogging the plant. Constant *wetness* around the roots is fatal, resulting in rot, and I am convinced that moderate drying out between waterings is as necessary for *Cypripediums* as for any other Orchid. To further assist drainage, I remove the bottom from the pot and then stand the crocks and charcoal (or limestone when necessary) till the pot is one-third full. On this I put a layer of fibre and then the compost. This method enables me to water every two days or so with the knowledge that there is no free water in the pot. In potting, it is essential to have the base of the plant above the level of the compost. I pot firmly, covering the whole of the roots, but no part of the rhizome from the level where the growths appear. If a plant is set in too deeply, collar rot occurs and the top of the plant separates from the roots. In watering the plants, or spraying them in summer, water must not be allowed to lodge in the centre of the growths. Even in the hottest weather this is unsafe. During the cold season I water only sufficiently to keep the leaves firm and erect.

I always stress the importance of dealing with watering at the same time as the compost and size of pot. There is no compost in which an Orchid will grow; there are many in which they will grow when watering is intelligently adjusted to the compost used. For instance, watering as I do would be fatal with a more earthy mixture such as many English growers use.

Humidity.—I try to keep my humidity up to 50 per cent. during the day in the hot season and often get it up to 80 per cent. or over at night. I do this by having my benches made of 1-inch square Jarrah, spaced 1½ inches apart. Under all of these are galvanized iron trays, three inches deep. In these coke is piled, except around the bench supports standing in the trays, where a circular piece of galvanized iron keeps a six-inch space clear around each support.

The trays are kept filled with water and the whole house is damped down morning and evening, except on the rare occasions when the shade reading goes below 70 deg. F. in the day. A clear space of water round each bench support prevents all crawling pests from getting to the plants. Flying pests are kept out of the house by the gauze which covers all ventilators. On the floor is a three-inch layer of small coke.

For ventilation I have an upper long ventilator the whole length of the roof. This opens in four sections, any one of which, or the whole, can be opened from a mere chink to its fullest extent. Along the bottom of the house are large ventilators, 10 inches by eight inches.

During most of the hot season my top ventilators are closed all day, with the bottom ones on the lee-side of the house fully open, except when the shade reading in the house exceeds 100 deg. F., then all ventilators are closed to keep a little moisture in the air. At night, all ventilators are opened wide except when the arid north, north-east or east winds are blowing. The lighting problem is partly solved for us automatically, in that the great heat forces us to whiten our glass and then shade the roof heavily with brushwood, or some similar substance to keep temperatures below 100 deg. F. My house is purposely built high and has three feet six inches of glass from the benches to the roof all round. My glass roof is heavily thatched over with straw. All my lighting is side lighting—an undesirable but necessary feature in a small 15 feet by 10 feet house. Most of the direct heat of the sun comes through the roof. Inside, the house is divided into two sections, one of them fitted with adjustable hessian blinds. In the bright section I grow my *Dendrobiums*, etc., while the heavily shaded part contains *Cypripediums*, etc. The best lighting for each individual species can, however, only be found by experiment. Directions from dealers' catalogues and books are useless. Our peculiar desert-like type of dazzling lighting is unknown in the Tropics, or for that matter in most countries where Orchids grow naturally, or are cultivated. From my own limited observations I have noted the same dazzling light around the Upper Murray towns—Wentworth, Mildura, and on the western side of the Divide. It is due to the low humidity, the aqueous vapour in the air of moister parts acting as an absorbing and scattering medium for the light rays towards the blue end of the spectrum which produce the glare. My practice is to move each plant to various parts of the house, and where it grows best there it stays. No definite system of shading for *Cypripediums* can be laid down. All vary in their requirements, with the general rule that the mottled-leaved types need denser shading, while the clear-leaved types appreciate more light, though in our hot season no *Cypripedium* will bear even the broken direct rays of the sun. This has to be made up for during the cool season, when, with the removal of the brush from the roof, careful sunning of the plants can be done. I consider this necessary if best flowering results are to be obtained, but great care is needed, as, if overdone, the plants quickly lose their chlorophyll and become pale and "washed-out" in appearance.

Temperatures here (providing these are kept from rising too high) do not cause much trouble. *C. Lowii* and a few others which are used to an almost constant heat would improve with a little heat on some of the nights in the cool season, but, as my house is at present unheated, I cannot discuss this point. I make shift for the time being by bringing such plants into the kitchen on nights in June, July and August when the thermometer shows signs of dropping too low.

Pests and diseases fortunately are rare with *Cypripediums*. The worst pests are the thrips, but by keeping the humidity as high as possible and spraying the plants fortnightly with a teaspoonful of Black Leaf 40 in a pint of water, these can easily be got rid of. Since I have isolated my benches from the house proper I have not seen a sign of them. My worst enemy is a small fly which unhappily got into my house following an importation from the East Indies. If anyone can tell me how to get rid of it, he will certainly receive my sincerest thanks, as I have waged an unsuccessful two years' battle with it. The eggs are laid in the compost, where the larvae hatch out and eat the tips of young roots. I remember reading that a writer in the "Review" had this pest, and caught it with strips of fly paper. His fly must have been of a much lower mentality than mine, which seems to be a much more knowing variety, refusing to thus politely exterminate itself.

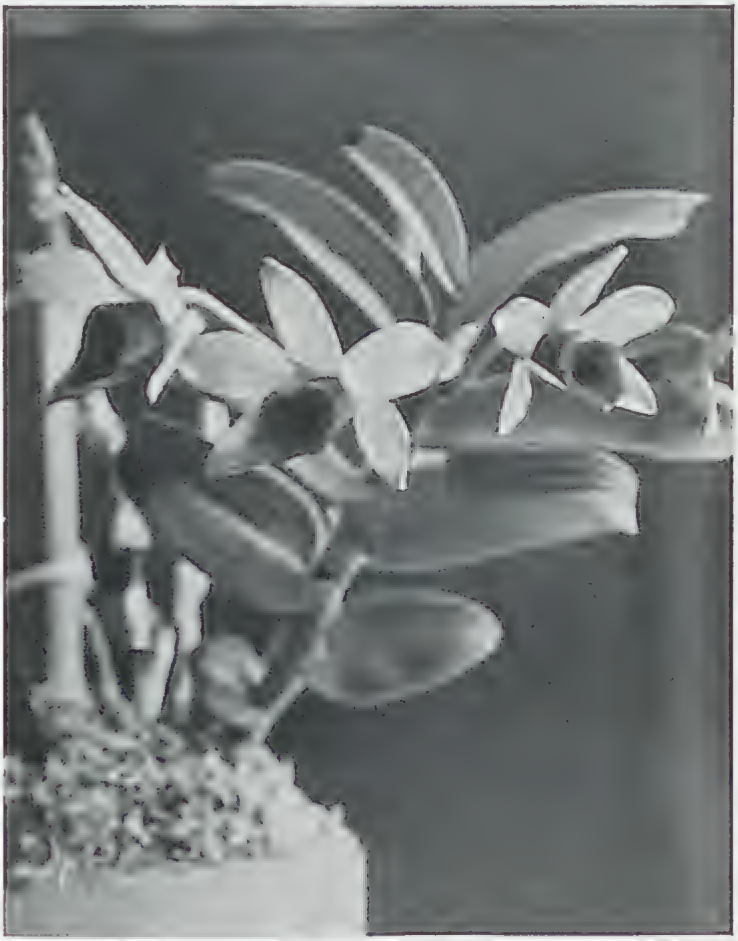
In this paper I trust I have not given the impression of being an authority, laying down rules for the uniniated. I hold firmly to the belief than each must work out his own salvation, governed by a plant's native habitat, and his own local conditions. These short notes simply set out what a keen novice is doing in our special climatic conditions to grow a delightful genus of plants, and, if anyone will be kind enough to correct or improve any of my methods, I will be particularly grateful. With the growing of Orchids, as with anything else worth-while, "To the attainment of knowledge there is no end."

● At the Society's meeting of November 28, 1939, Mr. W. J. T. Plowman exhibited a nice plant of *Miltonia Mariette*, with two racemes carrying eight extra large flowers. Sepals white, petals Orchid purple, the labellum nicely striped.

Dendrobium Ochreatum

P. A. GILBERT, *Lakemba, N.S.W.*

● The flower is one of the daintiest of the medium-sized Dendrobes. The species usually begins its growth in the autumn, growing slowly throughout the winter, bursting into flower on the new pseudo-bulbs during October. When it breaks into growth about March it should be transferred to the glasshouse, where it gently grows on until the flowering period. The flower lasts for two or three weeks. When the flower fades the plant should be placed in the bushhouse again, where it will go through a summer rest. The species will grow satisfactorily in the bushhouse all the year round, the few months glasshouse treatment adding size to the pseudo-bulbs. The usual *Dendrobium* compost is suitable.



DENDROBIUM OCHREATUM, Ldl.
Grown and photographed by P. A. Gilbert.

The flowers vary in size from two to three inches across, usually flowering two together from an upper node. The sepals and petals are buttercup yellow, the labellum having a purplish maroon blotch at its base. The pseudo-bulb grows to nine inches or more, being swollen at the nodes, the swelling being more perceptible after the pseudo-bulb sheds its leaves. It flowers usually from late September to the end of October about Sydney. The species is found in the Khasia Hills, Assam, India, at an altitude of about 4250 feet. It is also known by the synonym *D. Cambridgeanum.* It is procurable from the Indian or Siamese nurserymen advertising in this Review.

● *Vanda stangeana* may be ranked among the lesser *Vandas.* It is, however, a desirable species to have in a collection, owing to the finely tessellated markings on the perianth, and the rather quaintly shaped labellum. The coloration is ochre - yellow, with brown or purplish - brown markings. The winter treatment is similar to that accorded *V. coerulea,* and in summer it requires copious watering and high humidity. It produces one or two spikes, carrying up to seven or more flowers, which usually expand towards the end of November near Sydney. When the buds make their appearance in October it is advisable to keep them dry, as occasionally they turn yellow and drop off if watered too much.—P. A. Gilbert.

● The Phyamai Nursery's latest price list is to hand. There is a very nice range of species, reasonably priced, which would grow around Sydney. The full address of this firm is advertised in this issue.

VANDA STANGEANA *See a note in this issue.*

Grown by Judge Markell. Photo. by E. A. Hamilton.

Which Australian Orchid has the Most Extensive Range of Habitat?

● I am often asked this question, but at the present stage of our knowledge a definite answer is difficult. Certain terrestrials are found in all six States of the Commonwealth; but in the enormous areas of Queensland and Western Australia they are confined to southern districts, which considerably restricts their known range. The Blunt Greenhood *Pterostylis curta* can make out a pretty good claim. It is on record in all States, and, although apparently confined to the south of Western Australia, in Queensland it has been collected on the Atherton tableland inland from Cairns. The Ruddy Greenhood *P. rufa* is recorded in all mainland States, but it belongs to a difficult group of species; and some of the records should possibly be allocated to allied species. The Hyacinth Orchid *Dipodium punctatum* occurs in all States except Western Australia. I have personally collected it near the banks of D'Entrecasteaux Channel in southern Tasmania, and have received a specimen from a locality 100 miles west of Cairns, in North Queensland. It is found a considerable distance inland, as well as near the coast; and it seems to grow indifferently on sand, shale and heavy red or black soil, ascending from practically sea-level to nearly 4000 feet (New England). Among other terrestrials with a very extensive range are several *Caladenias, Lyperanthus nigricans,* a few *Prasophyllums,* one or two *Microtis,* and *Thelymitra aristata.* It is interesting to note that quite a number of our Orchids are also found in New Zealand. At least 24 species are identical. Seeing that characteristic Australian plants like *Eucalyptus, Acacia* and the *Proteaceae* are almost entirely absent from New Zealand, this is rather remarkable. How are we to account, for instance, for the occurrence in New Zealand of the comparatively rare *Chiloglottis formicifera,* which in our own continent is restricted to a few limited areas in New South Wales? Or if it was originally a New Zealand species, how did it come here?—H.M.R.R.

Cattleyas—Hot or Cold?

W. PALMER, *Drummoyne, N.S.W.*

● Although I have been cultivating Orchids for ten years or more, it is only during the past few years that I have given more thought and attention to the cultivation of *Cattleyas*. It is in reference to these plants that I now offer a few observations. No doubt I shall draw myself some heavy criticism from the more experienced and older growers, but even if I do that, much good help may be gleaned therefrom. As most readers know, *Cattleyas* are natives of Central and South America, and for this reason alone they think that these plants should be half baked with a heating system during the cold months of the year. While this may be necessary in some parts of the globe, in the Eastern States of Australia I do not think it applies at all. Allow me to quote from a volume published in 1880, when the collecting and cultivation of Orchids was still in its infancy. A collector in Brazil records finding *C. Mossiae* on a range of mountains at about 2000 to 3000 feet elevation. In the months of May and June (winter here as well as there) the thermometer readings were as low as 32° F. at 8 a.m. The highest reading during his stay of sixteen months was in February, when 85° F. at noon was recorded. He states that the hot season is the wet season, and it is then that the majority of Orchids flower. To show how cold the climate was, he says that *Zygopetalums* and *Warreas* (with flowers like *a Lycaste*) grow in close proximity. *Cattleya labiata* and *L. Loddigesii* are frequently found in swampy positions high up in the mountains, the original flowers of *Loddigesii* being pale purple, while in *intermedia* they are nearly white. Another interesting fact about *Cattleyas* and *Laelias* is, that they grow quite well on the rock faces as well as on trees. In one of the library books this can be seen clearly illustrated, and in every case the plants are facing the sunrise, while the early morning mists are shown rising from the valley below. In the houses where the *Cattleyas* were stored awaiting export there were large ponds of water, no doubt to give the required humidity to the growing plants. Many readers will no doubt say, "Why all this preamble?" What I am leading up to is this: Nearly all our *Cattleyas* are imported plants, raised from seed in overseas nurseries. If the parents could stand such extreme variations of climate, surely their progeny would do as well with a little care. In my own case I grow about one hundred mixed *Cattleyas*, species and hybrids, in a cool glass house. During the winter the minimum readings are frequently between 30 and 40 degrees F. I have no boiler, and have successfully grown and flowered many of these plants. With a small boiler to give my house a minimum temperature of 45° to 50° F. I am sure that the plants would do even better. I have found that in many collections growers who use boiler heat think they should keep their houses very low in humidity. This is all wrong. Heat of any sort dries up the moisture in a house, and nothing is more injurious than dry air to *Cattleyas*. Even in my cool house I give my plants a water every four or five weeks, spraying their leaves regularly. In heated houses—and I speak from practical experience—the floors and benches must be damped down every week to ensure good growing conditions, and prevent disease. Another important item is light. *Cattleyas* must have abundant light—not sunshine—but good morning light. My plants face the north-east in order to get the maximum winter sunlight, liking it very well indeed, as they show by their new roots, growths, and bright green foliage. Another point: Why close the ventilators in your houses in winter if you have a boiler? You need the circulation of air to create humidity as well as providing your plants with it, for do not forget that your *Cattleyas* breathe, and take moisture through the cells in their leaves. The closing of the breathing pores, or stomata, is the cause of the loss of a lot of flowers in various ways. I think, when all aspects are considered, *Cattleyas* in the temperate climates of Australia can, with a little care and forethought, be grown equally as well hot or cold.

At our November meeting Judge Markell related his experiences among the Orchideries of Brisbane during a recent visit. He spoke enthusiastically about all he saw and appreciatively of the many courtesies extended.

Cypripedium Rothchildianum created interest among "Slipper" specialists at the November meeting. It was a particularly attractive exhibit, being shown by Judge Markell. This was the first occasion the species had been exhibited.

pH and Peat Moss

G. C. LAIRD, *Auckland, N.Z.*

● I like experimenting. I am conducting an experiment now and would very much like some of my fellow-members in Australia to work along the same lines and let me know how they get on. I am interested in the theory that the pH. of composts has a definite effect on the growth of Orchids. In common with some of my fellow-growers, both here and in Australia, I found that peat moss had a decidedly beneficial effect on both root and leaf action, but, on the other hand, it became too wet in winter time, and, in addition, tended to break down any compost used to slush within one season—a definite disadvantage necessitating in many cases the unwelcome check of repotting. How then could I get the beneficial effects of the peat moss without actually incorporating it in the compost? In fact, what was its main property? From a firm selling brewers' sundries I obtained a swansdown filter bag, which I filled with peat moss. I next tested my rain water from the concrete tank, resulting in pH. 7.5. I then ran the water through the peat moss and retested. Now here, to my mind, is the most interesting part. The pH. immediately fell to about 5.0. Surely, then, the beneficial effect of the peat moss, as of the tan bark, lay in its acidity. I therefore repotted most of my plants in a mixture of coarse tan bark, rock phosphate and charcoal and, for the past three months, have been watering my whole collection with water which has first been run through the peat. The results are so encouraging that I would like fellow-members to check up. The plants have gone a dark, shiny green, the colour usually aimed at but seldom obtained, and this in spite of the fact that my houses are only lightly shaded with a coarse open screen. Root action, too, is already most promising. The result is particularly encouraging on a group of small seedlings and rooted back growths. My only fear is that this treatment may cause too much leaf growth at the expense of flowers. That remains to be seen. But if the method is successful in hastening the development of small plants until they reach the flowering stage, then it is certainly worth while.

VANDA HERZIANA

A beautiful hybrid derived from V. suavis x V. coerulea

Grown and photographed by G. H. Slade.

So, you want Something Exceptionally Easy to Grow

G. HERMON SLADE, *Manly, N.S.W.*

● In a great number of walks of life it is good advice to tackle any problem at its easiest link, and if you are interested in Orchids, and do not know where to start, there is no easier group to grow than *Epidendrums.*

Some of the showiest *Epidendrums* succeed admirably under conditions under which no other Orchids would grow at all, and a very fine show of these colourful plants can be produced in the home garden in any sunny spot; their chief requirement being to be left alone. Actually *Epidendrums* are among the largest genera of Orchids, there being over 600 different species found in Central and South America. Naturally over such a huge group there are many different forms, the great genus being divided by botanists into several groups or sections.

Most popular in Sydney is a group known to botanists as *Euepidendrum,* which contains the species *E. radicans, E. xanthinum,* and many others. These species of *Epidendrums* are characterized by their tall leafy stems which in growth somewhat resemble that of the Indian *Renantheras,* but they differ greatly in floral structure, as they flower from the top of the stem in a terminal raceme, instead of laterally as with *Renantheras.*

The plants belonging to this group of *Epidendrums,* best known to gardeners, include a number of hybrids, of which easily the best is one raised a number of years ago by Sir Jeremiah Colman, and named *E. Boundii.* This hybrid, which is known here as the "Crucifix Orchid," has become exceptionally common in home gardens, both in Brisbane and in Sydney, and seems to be increasing in popularity every day. It produces fine showy heads of bright orange flowers, and is in bloom perpetually; in fact with this, as with a number of other *Epidendrums,* there is no special flowering season.

Another very well known hybrid in Sydney is *E. O'Brienianum,* which grows taller and more straggly than *E. Boundii.* It is not generally quite so popular, although it is well worth growing, as it produces good spikes of somewhat larger flowers than *Boundii,* which are of a rich crimson colour.

E. Burtonii is another hybrid similar to *Boundii,* which produces bright yellow flowers.

E. Lilac Queen is another hybrid which has been raised by Sir Jeremiah Colman, by crossing *E. O'Brienianum* with a very distinct *Epidendrum* known as *E. Stamfordianum.* The resultant hybrid is a most vigorous plant, producing fine spikes of lilac flowers, and seems to be the tallest and strongest growing of all the *Epidendrums* commonly grown in Sydney. This is strange, because *E. Stamfordianum* is a plant which is quite a small grower, in fact very much like a *Cattleya* in growth, and which flowers from the bottom of the bulbs, yet the hybrid is considerably larger than either parent, and certainly at least ten times the size of *Stamfordianum.*

EPIDENDRUM PENTOTIS
Grown and photographed by G. H. Slade

The only species which seems to be grown is *E. radicans,* which is one of the finest of the group *Euepidendrum.* It produces its relatively large brilliant orange-scarlet flowers from late spring to autumn, and differs from the others in that the flowers are turned upright, so that they have a more typical Orchid aspect than the other *Epidendrums.* It is not quite so easily grown as the other members, but in nature it is always reported as growing in grass, and if it is planted amongst other foliage in the open garden it seems to succeed very well, but if planted out in the full sun like *E. Boundii* it burns rather badly.

Of the uncommon varieties there is a species described as *E. Loefgrenii,* which is perfectly pendulous; this reminds us of our own *Dendrobium tetragonum,* which unlike most other members of its genus decides to grow downwards. Although *Loefgrenii* has not yet been cultivated in Australia, it is well worth growing and produces a small head of bright flowers.

There are other groups of *Epidendrums,* especially those known as the *Encycliums,* which are quite distinct from the *Euepidendrums,* and which produce splendidly showy flowers. The best known species is *E. atropurpureum,* which produces a round pseudo-bulb about 2 inches high, surmounted by two hard leaves, from the top of which springs a raceme containing up to 20 flowers each 2½ inches in diameter. The best known variety of this species is *E. atropurpureum roseum,* which has purple sepals and petals, and a broad bright purple lip. Flowers of this species last for months on the plant and are delightfully scented.

E. memorale is another member of the *Encyclium* group, which is well worth growing; in vegetative structure it is similar to the species previously mentioned, and produces a warty flowering spike 2 feet long, with numerous flowers, each 4 inches in diameter and of a beautiful rose colour. This species succeeds very well when grown in a suitable place out of doors in full sunlight. It is Mexican, requiring similar treatment to the Mexican Laelias, so it is admirably suited for outdoor treatment, but should be cultivated in a pot with fibre, and not in the ground as with *Boundii.*

There is a great number of other members of the *Encyclium group,* which is awaiting enthusiasts and which will undoubtedly succeed well; in fact it is hard to find any *Epidendrum* which is not easy to grow.

The third group is the *Auizelium* type, these producing somewhat attenuated pseudo-bulbs about a foot long, surmounted by usually two strap shape leaves.

E. fragnans has grown for a number of years in the Botanic Gardens, Sydney, and produces its somewhat shell-shaped fragrant flowers every summer.

E. prismatocarpum is another desirable species of this type, and produces fine spikes of flowers about February; they are very showy and of a greenish-yellow colour spotted with numerous purple spots.

E. pentotis is another typical member of this group, which has pseudo-bulbs about 18 inches high, and surmounted with two strap-shaped leaves, which produce short spikes of flowers about 3 inches across, of the palest yellowish-green colour, almost white, and with a shell shape lip marked with bright purple lines.

The three groups of *Epidendrums* are very easy to differentiate, even when the plants are not in bloom, the flowers being also quite distinct.

The *Euepidendrums* produce typical shaped "Crucifix Orchid" flowers, and the column is completely united with the lip.

The *Encycliums* have generally somewhat claw-shaped flowers, usually with a large flat lip, an in this the lip itself is somewhat separate from the column and can be pulled apart from it.

In the *Auizelium* the flowers are another typical shape, such as illustrated in the photograph of *E. pentotis* on page 16, and the lip is movable, although completely united with the column.

So you see the genus offers great variety and interest, and what could be better to start with than these plants, when they all seem to possess that marvellous characteristic of being easy to grow?

● Closely watch the flower sheaths of your *Cypripediums* to see that no water lodges in them. Sudden drops in the temperature cause the water to chill the embryonic buds, which very often damp off. A pointed piece of blotting paper will soak up the water, leaving the bases of the leaves around the sheath quite dry.

● Place a hood of tin or a slanting piece of wood over your Meta or other baits to prevent them being washed away by rain, or when hosing.

● *Dendrobium Linguiforme,* var. *Nugentii* Bail. In the "North Queensland Naturalist" for Sept., 1939, the well-known Victorian Orchidologist, Mr. W. H. Nicholls, figures this very distinctive North Queensland form alongside "the typical form." Though stated as approximately natural size, both appear to us to be slightly enlarged; and in New South Wales at least, the type form, which is very abundant, has narrower leaves and floral segments than those of Mr. Nicholls' plate. The differences between the two forms, however, are well brought out.—H. M. R. Rupp.

About Thermometers

T. DOUGLAS, *Mosman, N.S.W.*

● The Fahrenheit thermometer in general use throughout the British Empire and the U.S.A. was introduced in 1714 and is an adaptation of the thermometer invented by Sir Isaac Newton (see Philosophical Transactions, 1701). Newton's lowest point was that of freezing, his highest that of boiling water, his starting point, however, being the heat of the human body, which he called by the round number 12, the duo-decimal system being then in use; that is, he divided the space between freezing point and the temperature of the body into 12 parts. Fahrenheit divided each of Newton's degrees into two, thus getting a more minute record. He also got a zero temperature by using ice and salt. Newton used linseed oil as the fluid, but mercury is now in general use. The boiling point of a Fahrenheit thermometer is 212°, the freezing point, 32°.

The Centigrade or French thermometer has zero for freezing point and 100° for boiling point.

The Reaumer, or German, has zero as freezing point and 80° as boiling point.

There are various types of thermometers for specific uses. The most suitable for the Orchid grower is one which records the maximum and minimum temperatures with needle markers actuated by the mercury, the range usually being from zero to 150°. The advantages of this type lie in making it possible to read in an instant, not only the current, but also the highest and the lowest readings reached since the markers were last set with a magnet. This should be done daily. It is immaterial whether this is done in the morning, at noon, or in the evening, but preferably about the same time daily.

Although an essential adjunct, it is not suggested that the thermometer be used as a guide to growing Orchids. On the contrary, it is submitted that the Orchids should guide one to the thermometer. Its use is not in looking to see if the heat is too high, or the cold too low, but rather to confirm the feeling and the observation that the heat is either too high, too low, or acceptable.

After all, the plants are the best and true meters. They record reactions to the conditions of their environment, they forecast results and give a warning or thanks. Try to decipher them, try to understand them, then verify your opinions and check the relevent answers with the thermometer.

In the end it is only by the application of comparison and observation that Orchids or any other plant can be successfully cultivated. In this, perhaps our modern scientific knowledge handicaps us, when compared with our ancestors. Maybe our faculties in observing nature have become dulled, and our perception lessened. They could and did tell the time without a watch, forecast the weather without a barometer, track a man, animal or plant with unerring ability, see Nature's signs, and read her signals, which we conceited mortals can neither distinguish nor discern.

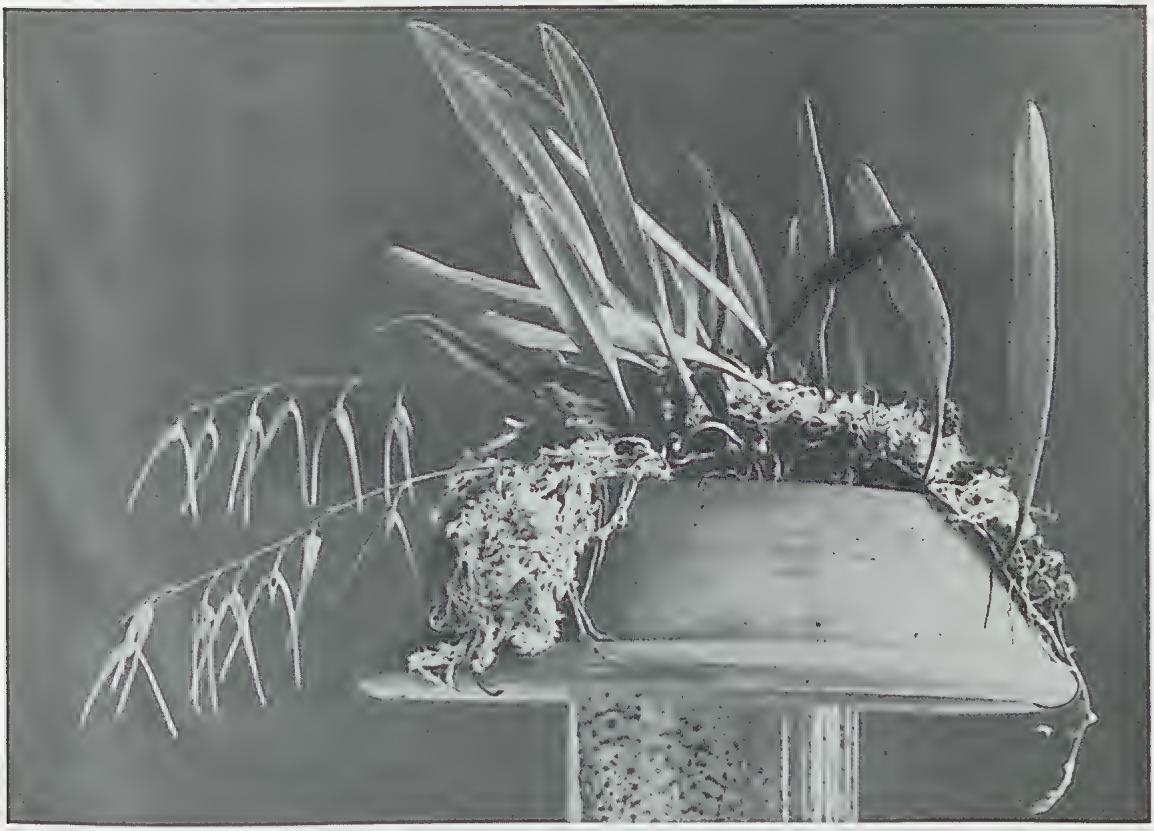
Like the watch, the barometer or the best laid schemes of mice and men, the thermometer is liable to lead us astray, simply because temperatures are not the Alpha and Omega of Orchid culture.

Let us remember that the effect of temperature on a plant acts in accordance with other factors, particularly those of bottom or reflected heat, light angle, intensity and duration, atmosphere conditions, humidity, purity or impurity, rate of circulation, rooting medium, period and intensity of rest, etc.

● The December number of the "North Queensland Naturalist" is entirely devoted to Orchids. There is an illustrated description, by Mr. W. H. Nicholls, of Melbourne, of a new variety of *Sarcochilus olivaceus* (var. *borealis*), discovered by Mrs. B. Sparvell, of Millaa Millaa, N.Q. The flowers are yellowish towards the centre and are blotched with dark red brown.

This description is followed by an article by the Rev. H. M. R. Rupp on the little-known tropical Orchid *Dipodium stenocheilum.* Although this species was described and named by Schwartz as recently as 1927, it was actually alluded to by Bentham (*Fl. Austr. VI.*, p. 301), who supposed it to be a form of *D. punctatum.* Schwartz says that the specimens from which he made his description tally perfectly with the Darwin specimens mentioned by Bentham. Mr. Rupp has received specimens from Dr. Flecker, of Cairns. The plant is slender, with dull purple flowers, unspotted.

Finally, there is another article by Dr. Flecker giving a brief outline of the life of R. D. Fitzgerald, with special reference to the unpublished plates recently brought to light in the National Herbarium of New South Wales.



BULBOPHYLLUM ELISAE, F. v. M.

A quaint Australian species; yellowish-green perianth; sepal 26 m.m. long; distribution, Queensland, N. S. Wales. Grown on an inverted flower-pot saucer.

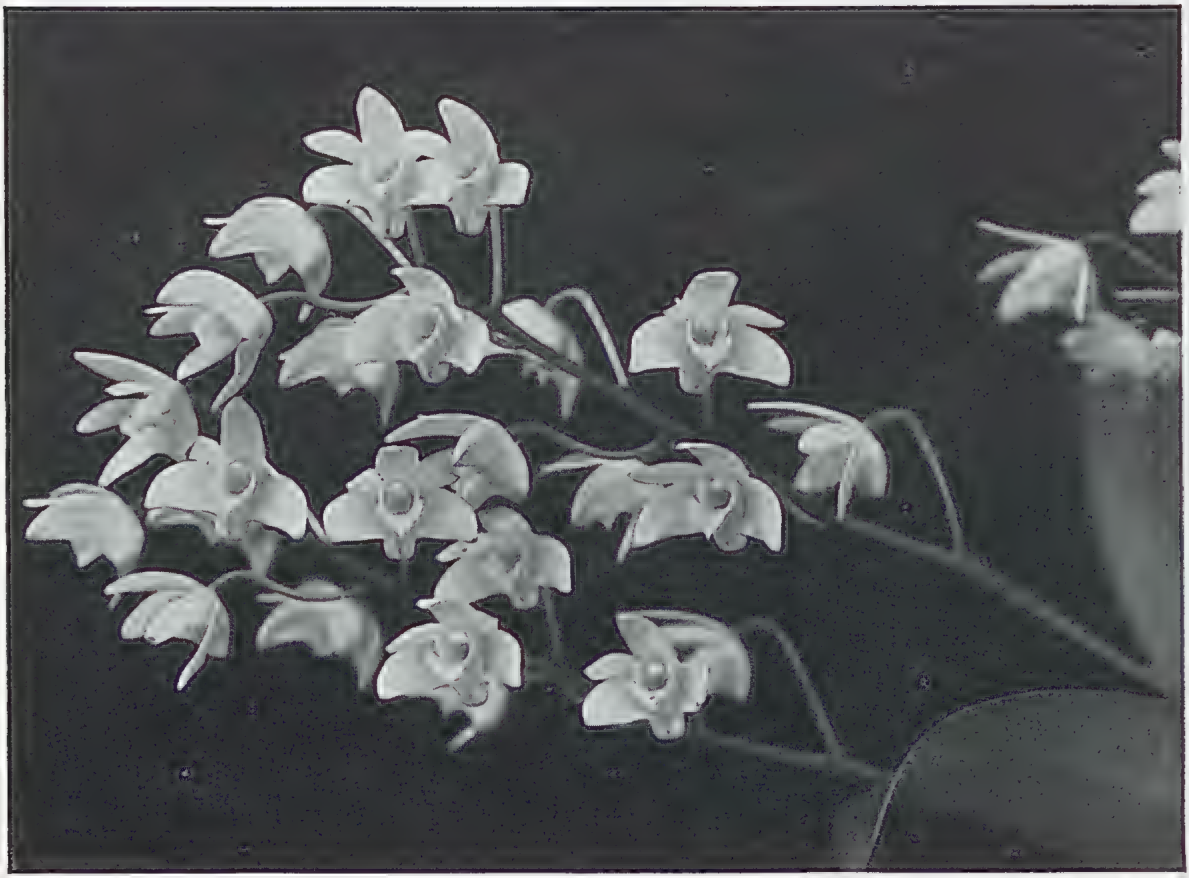
Grown and photographed by P. A. Gilbert.

Two New Orchid Records in Queensland

● Mr. H. Simpson, Essenden Guest House, Stanthorpe, recently sent a number of plant-specimens to the National Herbarium, Sydney, for identification. Among them were several terrestrial Orchids, and two of these constitute new records for Queensland; namely, *Pterostylis Woollsii* Fitzg. and *Chiloglottis trapeziformis* Fitzg. With the possible exception of the West Australian *P. recurva*, *Pterostylis Woollsii* is the most curious-looking member of the genus. The lateral sepals, which are deflexed, are often 2 or 3 inches long, and the labellum, which is extruded over their bases, is intensely irritable. The species, formerly considered endemic in New South Wales, was found in Victoria a few years ago, and it is now seen to have quite an extensive range, though sparsely distributed. The range of *Chiloglottis trapeziformis* is practically identical.—H.M.R.R.

● "*Bulbophyllum Elisae*, F. v. M., is hardly a *Bulbophyllum* and hardly a *Cirrhopetalum*. It appears doubtful to me whether it should be included in either genus, for, though the inequality of the sepals is characteristic of *Cirrhopetalum*, the flowers and habit are not those of the genus, and the form of the column and that of the pollen masses connected by a short gland or rostellum is not that of either, and the anther is unlike that of allied genera, being wholly without a point or beak."—R. D. Fitzgerald in his "Australian Orchids."

In the June issue (1939) of "Orchidologia Zeylanica," a coloured plate appears of a hybrid *Dendrobium adrasta*, var. *Sir Andrew Caldecott*. The new variety is derived from *D. Pierardii* x *D. superbum*, var. *giganteum*, and is a distinct improvement on the original hybrid. The raiser, Mr. Ernest De Saram, says: "The flower, in my opinion, combines the best features of its parents."



A pretty form of Dendrobium delicatum. Colour, pale pink.
Photo by H. J. R. Overall

● "I had a most successful season for flowers with *Dendrobium Parishii* this year, though they all came in quite early. I attribute this to the abnormal and severe drought we have had recently. My garden well ran dry, and we had to transport water from distant wells for our household needs for nearly two months. There was scarcely any water to spare for garden needs, and all that my Orchids got was a splashing of water about twice a week. The result, however, was marvellous. The enforced resting of the plants led to a rich harvest of flowers. The drought taught me a lesson which I would never have learned if Nature had been more generous with water."—S. J. Perera, *Orchidologia Zeylanica,* June, 1939.

At the October meeting Mr. A. B. Porter exhibited a particularly fine specimen plant of *Sarcochilus Hartmannii.* The compost was composed of old leaf mould, the plant growing in a shady position in his bushhouse.

● Hybridization is making rapid strides in the Netherlands East Indies, specialities being hybrids of the genus *Dendrobium,* and the vandaceous group. Some very fine hybrids of *Cattleya* also have been raised. "Anggrek Boelan" for December lists seven new hybrids for the N.E.I. One hybrid mentioned excites the curiosity, namely, *Dendrobium caprice,* the parentage being *D. macrophyllum* x *D. undulatum,* the raiser being C. A. Chevalier. "*Cattleya Nagrok* is one of the first *Cattleya* hybrids raised in the N.E.I. The parents are *C. Gaskelliana* and *C. Malines.* The flowers are more than six inches wide. The petals and sepals are of a rosy-violet, the lip is soft rose, yellow in the throat, and on the apex a large crimson blotch." This hybrid is a product of the Nagrok Orchid Nursery, Soekaboemi.

A valuable source of soluble lime for Orchids that require it is available in the egg-shells of poultry. Crush them up finely. The roots cling tenaciously to the particles.—P.A.G.

A Holiday Trip to Mt. Fox and the Famous Wallaman Falls

G. G. BASS, *Brisbane*

This story should be read as a sequel to Mr. A. Glindemann's article which appeared in the December issue of this Review.

● To those who desire a holiday tour free from the troubles of the world and away from civilization, I would strongly recommend the above trip. What more could one wish for than glorious scenery, streams of icy cold running water, game in plenty, Orchids in thousands perfuming the air, good quiet horses, and miles of splendid country to roam in.

My companions on this trip were Alf. Glindemann and Norman West. Alf. was the guide, who supplied thirteen horses and two foals. Six of these were used for packing and the others for riding and spares. Alf. is an old hunter and knows every inch of this country. Often we saved miles by cutting across ridges where there was not the semblance of a track, but always arriving at our destination or camp in good time.

The Wallaman Falls.—For many years I have had visions of seeing this wonderful piece of Nature's beauty. All of us, when going on a holiday to new country, visualize what it will be like; sometimes our dreams come true, but often they are dashed to the ground. The Falls and adjacent gorges and the scrub have to be seen to be appreciated. Imagine a stream of water, about 40 feet wide, falling a sheer drop of about 950 feet. What a thrill it gave us—one never to be forgotten. Towards the bottom the water appears to form a bridal veil and the rays of the morning sun glisten in rainbow hues on the misty spray. On top of the Falls, before the water makes its leap, an exhilarating swim can be had without danger. I have seen the Tully Millstream, Leura, Big Salt Water, Barron and other falls, but all fail in magnificence compared with the glorious beauty and grandeur of the "Wallaman."

From Ingham there is a perfect concrete road to Trebonne and then to Stone River and up the Mt. Fox Range a fair car road is traversed. From the top, a distance of about six miles, the road is fairly rough. The distance up the range is about four miles, and from Ingham about 34 miles, and to Wallaman about 60 to 65 miles. A car could do the trip comfortably in four to five hours, allowing for a drink on the way.

I would advise anyone desirous of spending a holiday at Mt. Fox to go during the months between August and November. Before this it is too cold and after too wet. It is necessary to take all food and camping gear sufficient for the holiday in the car. There are no shops, hotels or private accommodation at Mt. Fox. Visitors are always welcome to a cup of tea at the homesteads.

Those who earn a living at the Fox and district do so by tin scratching, timber getting or working on the cattle stations. All seem happy in their different spheres of life and love the country.

Mt. Fox is an old volcano practically void of vegetation and shaped something like a basin turned upside down. Scientists say it is about three million years old, so we need not fear an upheaval in our time.

Now for a fortnight's trip through scrub, forest and hill country, during which time we covered about 230 miles. Up at daylight, feeling fit and well. A good bathe in the nearest stream and we are ready for a hearty breakfast of porridge, damper, jam, syrup and perhaps a few eggs, if you have been lucky in finding a Scrub-fowl's nest (*Megapodius reinwardt*).

All give a hand to clean up and pack the horses in readiness to be off. At about 7 a.m. we are on our way, a keen lookout is kept for new Orchids, wallabies and kangaroos, the skins of the latter fetching a good price. Alf. is a dead shot, using a rifle like a tradesman, for I have never known him to miss. The first night out we camped at Garrawuldt Creek, an old tin mining camp. Two old men here are trying to earn a living with pick and blower. We spent an hour or two round our camp fire relating tales of what might have been. Moving on next morning we called at a homestead for tea and a chat. After several hours travelling we pitched our tents on the banks of the Upper Burdekin, in the Oak Hills district. We expected to get good fishing and shooting here, but were sadly disappointed. We either had the wrong bait or the fish were not hungry. From here we went to a place called Flaggy, and then down the Sea View Range to Abergowrie. What a range! There is only about two miles of it, but it is rougher than the old Harvey's Range Road. Oak Hills Station people bring their cattle down this track and pack their goods up on horses.

From Abergowrie we made our way to an old cattle station named Rosedale. We camped on the bank of a glorious creek, and here is where we got real fishing. Black bass up to three pounds are caught without any trouble. The water was so clear that in many cases we could see the fish take the bait. What a thrill we got. Plenty of fish for breakfast, dinner and tea, thus satisfying our enormous appetites.

Orchids were here in plenty, but none were what we were looking for. During this day's outing Alf. shot a big dingo. It measured 5 feet 9 inches from the tip of the nose to the end of its tail. Truly a fine specimen. This chap had caused a lot of trouble in the district, so we did the farmers a good turn. After crossing the Herbert on our return journey, we ran into heavy rain and got soaked to the skin. Norman thought it was a great joke when I put a sweater on to keep myself warm. The joke was on him when we got into the cold and windy country at the top of the Sea View Range. He was shivering, while I was comfortably warm. Good rollicking songs kept our spirits up. Later on the rain stopped, then we were able to build a big camp fire and dry our blankets and clothes.

When the weather permitted we camped on the ground under the stars and slept like logs, with never a care in the world. Another old tinfield named Black Adder was our next stop. Here we found Orchids in profusion, enormous staghorn and elkhorn ferns, and as many Scrub-fowl and Brush-turkey (*Alectura lathami*) as one could wish for. The birds feed on the ridges of the scrub in the morning and come down to the streams in the evening to drink. The Scrub-fowl make their nests of leaves and frequently several will use the same nest. As many as 60 eggs have been found in a nest. The heat from the decaying leaves acts as an incubator, and when the young are hatched they scratch their way out and look after themselves.

From Black Adder we made our way to Wallaman and then back to the Fox.

The pest of the bush is the stinging tree, with its furry leaves, heart shaped and bearing a bunch of red fruit or seeds like small grapes. Beware of the stinging tree, as the pain is maddening. The juice from the roots of the tree is supposed to be an antidote. Snakes are in the district, but we did not see one. Scrub ticks can cause a lot of trouble. They are little grey chaps, with numerous legs. They burrow under the skin and eject poisons out of their system into yours. Scrubbs ammonia and kerosene are the bush remedies. Crows and dingoes make themselves nuisances, but to the trees the greatest enemies are the various types of mistletoe. From my observations they appear to work under the bark of trees and practically ring-bark them. This causes the trees to die.

The trees in the Mt. Fox district that stand out above all others are the flooded-gums. They rear their heads seventy to eighty feet without a branch. The timber is good for inside flooring, but no good in the ground.

Yellow robins, parrakeets, Orchids, staghorns and beautiful ferns are some of the beauties of the bush. Pages could be written about this glorious country, but space will not permit.

Make your next holiday a trip to Mt. Fox and the Wallaman Falls, and see the scenic beauties for yourself.

April, probably, is the most critical month in the year for Orchid growers in Australia. During this month numerous species will be completing their growths preparatory to a seasonal rest. It is therefore necessary to be extremely watchful at this time of the year with regard to watering. Growers are sometimes caught unawares in early autumn by sudden drops in the temperature, especially at night. Watering should not be as frequent as in the summer months, being safest if carried out in the morning on a rising temperature. In the late autumn it is hardly necessary to water on dull or very cloudy days, as invariably these days are followed by rain or a cold snap. As the nights become colder and the days shorter, so should watering be less frequent. As winter approaches, the water from the tap becomes very cold, making it very risky to use it on many species. Then it is best to use a bucket for dipping pots in up to the rim, the temperature of the water being raised to about 75 degrees by the addition of hot water. All watering from May to August should be carried out in the early morning on bright days, so that by night time pots will have dried out sufficiently to prevent decay or damping off. Avoid overhead watering as much as possible, and particularly so in the glasshouse.

The Utility of Old Bulbs

● It is somewhat difficult to determine the precise age to which an Orchid bulb may attain before the term "old" may be correctly applied. Growers have varied in their ideas to the extent of several years, but for general purposes one may safely define the age as one of at least four years. Very much of the success in growing Orchids to their highest state of perfection depends on the condition of these old bulbs. If they are vigorous and give assistance to the new growth their retainment is advisable, but if, as often happens, they use for their subsistance food which should go to the formation of a new bulb, then their removal is justified. The cultivator needs to carefully consider the factors that determine whether he should separate the old bulbs from the newly formed portion, or whether their continued attachment will be beneficial to the future growth of the plant. The general belief, more especially among older cultivators, is that the greater the number of bulbs the stronger and more valuable must be the specimen. Happily, the present-day and younger growers fully realise the erroneousness of this idea, and their continued success in the production of remarkable plants gives additional proof of the correctness of their opinion that old bulbs frequently act injuriously on the new growth and bulb.

There is no need to search far for material that will help us in obtaining a clear comprehension of the matter. Almost every collection contains a plant, either species or hybrid, consisting of about eight consecutively formed bulbs, the back or old ones of which are fairly plump and, therefore, naturally lead us to suppose that their apparent healthy and vigorous condition is of assistance to the leading growth. To prove whether this be a fact or not, the rhizome, or horizontal stem connecting the bulbs at their base, should be severed at a place that will separate three or more of the oldest bulbs. If these forthwith commence to shrivel it is a sure sign that they have been deprived of their source of nutriment.

On many of the older plants, small growths may be seen pushing forth from the unflowered portions of the bulbs. These form a ready means of increasing stock and if they have one or more roots their removal may take place on any desired occasion. In the case of rare varieties one of the young plants is placed in the centre of a suitable small pot, but when the variety is plentiful then three or more may be placed in a pot in order to insure a specimen plant being rapidly produced. In those cases where the young plants have not yet produced roots it will be found advisable to cut up the old bulb into suitable portions, allowing several inches to each growth. These portions should either be laid on damp moss until roots develop or else placed in small pots and kept moist by occasional spraying. The portion of old bulb will supply nutriment to the young growth until it is able to maintain itself by means of its own roots. Some varieties are not very free in producing young growths, and in these cases an old unflowered bulb should be severed from the plant and laid on some damp moss, when in due course growth will appear at many of the previously dormant buds. The chief secret in the production of easily flowered *Dendrobiums* is the annual creation of fresh healthy plants.

The tendency to produce second growths must always be discouraged. As soon as a plant has almost finished making its bulb it should be removed to a cooler and drier atmosphere, only sufficient water being given to prevent shrivelling. This prevention of further growth will allow the plant to concentrate all its energies on the production of thick textured flowers of lasting properties.

Dendrobiums require treatment somewhat similar, but even more sunshine may be given with beneficial results. These plants have the advantage of being able to withstand, during the season of rest, even cooler temperatures than those accorded to *Cattleyas*. In some instances multiplication of the existing stock may be desired in preference to an abundance of flowers. This can easily be accomplished with *Dendrobiums*, for if the plants are kept in a warm and moist atmosphere during the autumn and winter, ripening of the bulbs will be prevented, and in place of the usual flower buds in the springtime many of the nodes will produce young plants. These, after a few months, will produce roots of their own, and may then, with a piece of the old bulb, be potted separately. The autumn, therefore, is the time to decide whether flowers or young plants are required.

● "One of the loveliest *Vandas* of the East is *V. suavis*, var. *Sanderae*. The flowers measure about 3 inches across; they are pure white, with light greenish yellow spots in place of the typical red or blood-purple spots. Really one of the most wonderful *Vandas* ever seen!"—"Anggrek Boelan," December, 1939.

Treasures of An Orchid Herbarium

Rev. H. M. R. RUPP, *Northbridge, N.S.W.*

● "Musty, dusty, shabby boxes of dead flowers and leaves that reek of naphthaline: what treasures can there be in a herbarium, except for a few botanists with a flair for long Latin names?" So scoffs the sceptic; but he is more truly a sceptic than he realises, for he simply "*does not know.*" To begin with, it is unnecessary for a herbarium to be either musty (whatever that may mean), dusty or shabby. Naphthaline, or some equally effective insect-deterrent, is perhaps inevitable. But my herbarium is not merely a receptacle for dried and pressed Orchids. It is a treasury of precious memories that now reach back for almost half a century.

Here is a sheet of specimens labelled "*Diuris punctata*: Wannon Falls, Vic., Nov., 1893." A long way back; but instantly I am there, in the western district of Victoria, forty-six years ago. A long sweep of green sward, a clear, swift-running river; suddenly a yawning chasm of dark rocks breaking the green, and foaming waters thundering down into the basin a hundred feet below. Not far away, a youth stooping to pluck the lilac-hued *Diuris*. That is the picture my mind can see in this herbarium-sheet: and it has its background, too. A few miles away is the village of which Adam Lindsay Gordon sang in one of his rollicking ballads:—

> On the fields of Coleraine there'll be labour in vain
> Before the Great Western is ended!
> The nags will be toiled and the silks will be soiled,
> And the rails will require to be mended.

In memory I wander once more over the green hills of Coleraine, till they dip into another valley which, like that of the Wannon, sends its waters to swell Victoria's most westerly river, the Glenelg. This is the Wando, which you will find often mentioned in Bentham's "Flora Australiensis," though he misspells it "Wendu." For here, at Wando Vale, was the home of J. G. Robertson, a noted early Victorian botanical collector. A few miles upstream was Wando Dale, owned by Robertson's nephew, William Moodie, father of one of our Orchid Society members. There I spent many a happy day in my youth, rambling with young Moodies in search of "spider" Orchids and other delectable wildflowers. All this is the background of that *Diuris* sheet.

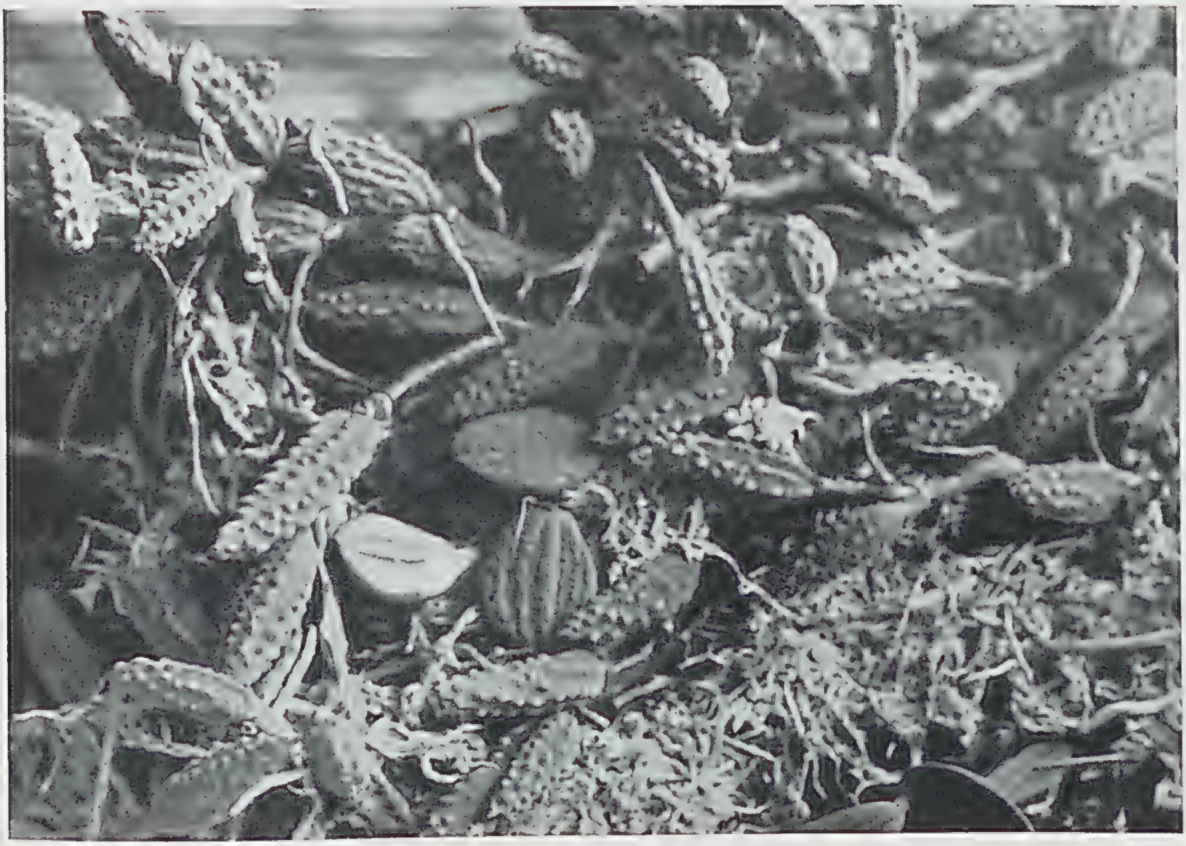
Here, again, is *Caleana major*, the Duck Orchid, labelled "Buninyong, Vic., Dec., 1896." And it carries me back to 'Varsity vacations spent at my father's rectory, and long rambles over rough hills still scarred with the wounds of the first gold rush in Victoria; and the excitement of my first "find" of *Chiloglottis Gunnii*, with its quaint gnome-like flowers; and a scramble up Mount Buninyong itself, there to come upon a colony of the biggest Greenhoods I had ever seen (many years later to be known as the Sickle Greenhood, *Pterostylis falcata*).

And here is another sheet of the same period, which brings back to me the thrill and joy of my first sight of an epiphyte growing; the dainty little *Sarcochilus parviflorus* tangled in a twiggy Coprosma at Fern Tree Gully in the Dandenongs. The Dandenongs were all primeval forest then, and how lovely they were!

Here is a "spider" Orchid from the Victorian Grampians, which brings to mind a camping expedition with two old schoolmates, one of whom later became a distinguished Imperial civil servant, Sir Charles Belcher. The other, I remember, scared the wits out of us by getting bogged in a treacherous swamp, from which he was rescued in the nick of time by an old duck-hunter.

This is a fine raceme of *Cymbidium canaliculatum*; and it came from the first *Cymbidium* I had ever seen. I remember perfectly where I found it—on a box-eucalypt at the back of the range overlooking Tamworth, in northern New South Wales.

Here is another Sickle Greenhood, this time from the foothills of Mount Barrow, in Tasmania, recalling a delightful fortnight spent there in 1922. On the next sheet is yet another, labelled "Barrington Tops, N.S.W.," a far call from Mount Barrow. Barrington Tops is ever associated in my memory not merely with glorious views and Orchids galore, but with the companionship of the late John Hopson, Eccleston farmer and orchardist, entomologist and lover of Nature, and a man whose friendship was beyond value. Nothing gave him more pleasure than to pilot a fellow-naturalist through those mountains and valleys,



DENDROBIUM CUCUMERINUM, Macleay

An Australian oddity with xerophytic habits; the largest leaf in the illustration measured 40 m.m.; diameter 12 m.m.; distribution Queensland, N. S. Wales; called Cucumber or Gherkin Orchid. Two varieties of D. linguiforme are also shown (flat leaves).

Grown and photographed by P. A. Gilbert.

which he knew so thoroughly and loved so deeply. Every now and then he would vault off his horse and an old log would be rolled over, and into the collecting-bottle would go some unfortunate beetle, destined perhaps for a museum on the other side of the world. "I think," he would say, "if we were to try a spot I know a couple of miles over yonder, maybe we might find an Orchid or two." And he was always right, except that "one or two" was an absurdly moderate estimate.

And so, you see, there is more in a herbarium than meets the eye; for nearly every sheet has its memories of joyous rambles and good companions in days gone by. Many of my specimens, of course, are not of my own collecting; but these, too, are valued for far more than their botanical interest. For do they not continually remind me of the kindness of many good friends, who have thought of me in their own rambles, sometimes as much as a thousand miles away, and have said, "He shall share"? When I look at the specimens, living or dried, and the books, and the paintings, and the photographs, which are the gifts of friendships that have come to me through Orchids, how can I be other than an Orchid-lover?

● In the January number of the "Victorian Naturalist" there appears an excellent photograph of the new Victorian Greenhood, *Pterostylis alveata* Garnet, already alluded to in these notes.

There is also a plea by the Rev. H. M. R. Rupp for restoration to specific rank of Lindley's *Caladenia pallida*, a Tasmanian Orchid allied to *C. Patersonii* R. Br., in which it was included by Bentham. Mr. Rupp further seeks recognition of a richly-coloured Tasmanian form of the last-named species, as var. *rosea*.

Orchid Mysteries from New Guinea

Dr. C. H. JAEDE, *Mascot, N.S.W.*

I suppose most of us who attempt to grow Orchids have, at some time or other, had the desire of being able to go to the tropical jungle, or other place where the wily Orchid lives. But, probably on account of age, lack of the necessary funds, and limited time, etc., few will be ever able to enjoy such a treat. However, we can still live and hope.

The nearest approach to such an enjoyment, a type of second-hand pleasure, is to obtain from some friend, residing in such countries, or someone who is willing to exchange, plants which are unnamed, unflowered, and, hopefully, unknown. I am afraid, that, to some people, I must be a bit of a *bore* and a *nuisance*, seeing that if I find out that they live in the tropics, I unhesitatingly ask them to send me some of their indigenous Orchids. As they very rarely respond, I suppose that I am considered one or both of the above species.

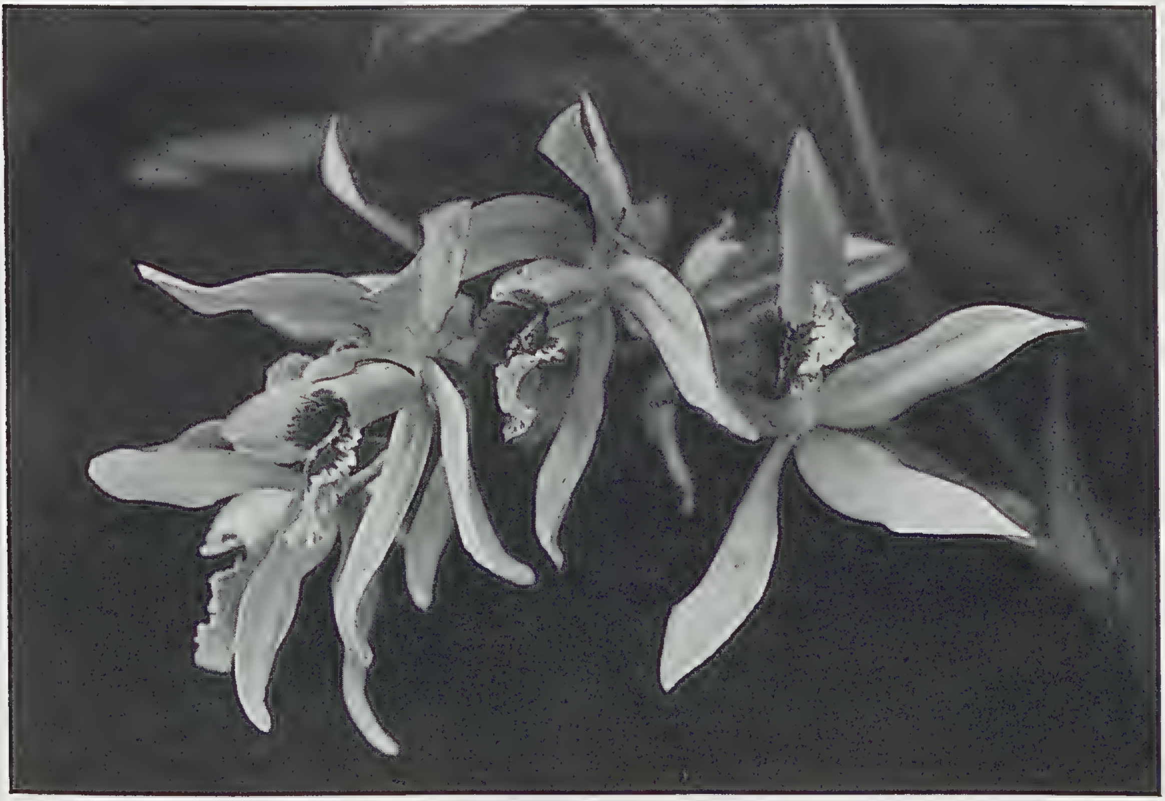
But, on this occasion, unfortunately for her, I possess a sister who resides somewhere in New Guinea; and, having pestered her on numerous occasions, she at last wilted under those continuous barrages, forwarding me a case of strange plants. I had an hour of extreme pleasure in trying to determine the types they represented. My sister has, on several occasions since, come up to scratch.

The types sent were many and various; an enormous *Bulbophyllum* with bulbs the size of an orange and leaves four feet in length, which my sister informs me grows on the under sides of trees, the leaves hanging downwards; so far it has not flowered. Then another of the same family—it may be a *Cirrhopetalum*—with bulbs scarcely two millimetres in diameter, which sends up a tiny spike quite three inches in length, covered with very small white flowers. Numbers of strange Renanthera-like plants, which in the original plant must have been yards long that may flower some day. A small *Dendrobium*, with white flowers, the petals and sepals tipped yellow, the blossoms being the size of a *D. Kingianum*. And again another type of *Cirrhopetalum*, with quite small bulbs, which sends up a long spike surmounted with an umbel of quaint bronze-tinted flowers. Then down at the bottom of the case, which incidentally was infested with cockroaches, immune to hydrocyanic acid fumigation, was a *Dendrobium* with long pseudo-bulbs similar to those of *D. superbum*. After enduring conditions which no ordinary Orchid should be asked to endure, it produced two or three blooms which had the odour of *Dendrobium superbum*, and also had its shape, but the colouring was quite different; the lip was certainly purple, but the sepals and petals were white, perhaps slightly flushed with pink. This agreed with the description given to *D. superbum*, var. *Huttoni*. Of course, it may be another new variety, seeing that in the greater number of the plants which have flowered with me, there is a distinct flushing of the petals and sepals. Strangely enough, in one plant which was given to an enthusiast in England, the flowers were those of the type.

Evidently that part of New Guinea from which these plants are obtained (for those really inquisitive people I will let them know that they come from the hill districts where gold is also found) may be termed a new locality for this species; but the strange fact is that although the type is found there, the variety is far commoner.

My sister, when asked how and where it grew, answered cryptically: "It grows hanging downwards from the trees in nasty places where only the niggers can go." Information in regard to rainfall was more definite. Throughout the summer there are daily storms, and it is rarely dry. The dry season lasts only three months, from July to September. This knowledge may be of use to those who try to grow these types of Orchids which come from the goldfield region of New Guinea.

Two items were new as exhibits at our December meeting, *Dendrobium suavissimum* and *Bulbophyllum Fletcherianum*. The *Dendrobium* has the habit of *D. chrysotoxum*, but the flower somewhat resembles *D. fimbriatum*. It seems to be an improvement on both species. The colour is more striking than that of *D. chrysotoxum*, while the flowers last longer than those of *D. fimbriatum*. The flower of the *Bulbophyllum* was both striking and extraordinary, resembling a red *Hibiscus* flower. Messrs. G. Cruickshank and A. B. Porter each exhibited a plant of the *Dendrobe*, the *Bulbophyllum* being under the tender care of Mrs. M. E. Lincoln.



COELOGYNE PANDURATA, Ldl.

Flower pale green, labellum marked with black, flower up to four inches across; habitat Borneo (Sarawak); grows in hottest rain forests on trees near swamps and rivers. Thrives best under "warm" treatment.

Grown by Dr. C. Jaede. Photo by H. J. R. Overall.

Notes from the December Issue of the "Victorian Naturalist"

● An article of exceptional interest to students of our native Orchids is that by Mr. W. H. Nicholls describing the discovery by the Misses Banfield, of Ararat, of *Diuris brevissima,* a species figured by Fitzgerald in an unpublished plate, but never described. Fitzgerald is said to have found this *Diuris* at Lawson or Woodford on the Blue Mountains; a recent search in that area was unsuccessful. It is rather surprising that it should be brought to light at Ararat in western Victoria; but Mr. Nicholls makes out a very good case for his determination, and his illustrations on page 126 leave little room for doubting the identity. The Misses Banfield are to be warmly congratulated on this quite important "find."

In the same issue Mr. Nicholls records another addition to the Victorian Orchid flora: viz., *Caladenia arenaria* Fitzg., a handsome member of the "Spider" group of this genus. Here, again, the locality is somewhat surprising—South Gippsland. Fitzgerald's locality was Yanco Creek, in the Riverina, an area with climatic and topographical conditions widely differing from those of South Gippsland. Congratulations to the discoverer, Miss E. Rossiter.

An article by Mr. W. L. Williams on "The Variability of *Prasophyllum Frenchii*" challenges attention. More than one species of *Prasophyllum* presents peculiar difficulties in this respect, because where you have a large number of small flowers massed together in a spike, the slightest variation from the type may result in such a different appearance in the whole spike as to suggest a distinct species. Mr. William's observations should be followed up by those who have access to this species. In New South Wales it has, up to the present, only been seen on the southern highlands.

Orchid Climatology or Geographical Distribution

H. GREAVES, *Adelaide Botanic Gardens*

● There is no doubt that the success in Orchid cultivation in general calls for a little knowledge of the regions in which any particular genus inhabits.

It is my opinion that, with this knowledge, it forms a background, wheras so much quicker success will follow, if we have a reason for our methods before we put them into practice.

Not being my intention to remark on any one of the 600 odd genera in particular, each one being a subject of its own, I will endeavour to outline the geographical distribution of only a few of those noted for their horticultural value.

With the epiphytal Orchids are associated some terrestrial and sub-terrestrial genera, whose habitats are within the epiphytal region, such as *Spathoglottis, Selenipedilum, Phajus, Thunia, Calanthe*, and others.

The geographical limits of the epiphytal Orchids may be stated to be the thirtieth parallel of North and the thirty-fifth parallel of South latitude, this being a broad zone having for its breadth a little more than one-third of the distance between the poles, and roughly three-sevenths of the land area of the globe.

Masdevallias are alpine plants, which have their home on the mountains of tropical America, some reaching a vertical range of 13,000 feet. At this great altitude at which they are found the pressure of the atmosphere is so much diminished that the air is not only much rarer, but is also much colder and its capacity for absorbing moisture is also greatly diminished, but, owing to local causes, the saturation point is being constantly reached.

On their native mountains they grow in a variety of situations, on the ground, in the crevices of rocks, and even on roofs of buildings, but always where there is little or no soil. In the humid climate in which they live, their vegetation at no period is interrupted, and when grown in glass houses a constant supply of water is their chief requirement.

Cattleyas and *Laelias* are found growing under nearly the same conditions. They are all natives of tropical America, and are spread over an immense territory, which extends from the near northern tropic, where is crosses Mexico, to about the thirteenth parallel of the fifth latitude.

Throughout this region the atmospheric currents are constantly passing, owing to the action of the trade winds.

In Mexico and Guatemala, *Laelias* are found at high elevations, the altitude ranging from 6000 to 8500 feet, and where the average mean temperature varies from 50 deg. to 68 deg. F., according to the altitude, although it frequently rises to 105 deg. to 120 deg. F.

In the Colombia and Guiana regions, the splendid *Cattleyas* of the *labiata* group are always found in the ravines and valleys of the Cordilleras at elevations ranging from 2000 to 5000 feet. In these places the plants affix themselves to trunks and branches of trees, and to bare rocks in the gorges of the mountains, in the latter case often exposed to the direct rays of the tropical sun by day, and low temperatures at night caused by rapid radiation, which usually sinks to about 50 deg. For several months of the year they are drenched almost daily by heavy rains brought from the Atlantic by the North-east trade winds.

Cattleyas which grow in these exposed places have shorter stems and more leathery leaves than those which grow upon trees, where they receive partial shade from the foliage of trees.

The *Cypripediums* are confined to the Indian monsoonal regions. Those that are found along the mountain chains grow at a very high altitude, where the rainfall is frequent, and the dry season of short duration. In these elevated situations they are found growing chiefly on the ledges, and in the crevices of limestone rocks.

Dendrobiums are spread over an immense area in South-east Asia, the Malayan Archipelago, Australia, and the islands of the Western Pacific, a region that cannot be very clearly defined, but which can be roughly stated to be between the 28th parallel of North and the 40th parallel of the South latitude and between the 80th and 160th meridians of East longitude. Beyond these limits there are outlying members in Southern India, Japan, the Society Islands, New Zealand and in some other places.

However, most of the *Dendrobiums* that

find favour with growers are confined to a small portion of this region. The climate of the *Dendrobium* is characterised by a high average temperature, accompanied with great moisture, throughout the greater part of the year, the Australian portion of it being a partial exception.

In the lower Himalayan zone the temperature ranges from 80 deg. to 90 deg. F., and even higher in the enclosed valleys, but at the opposite season it is from 10 deg. to 15 deg. lower.

The humidity of the atmosphere during the greater part of the year is near the saturation point, owing to the enormous amount of vapour which ascends from the Bay of Bengal being drifted towards the mountains, and which, being condensed by contact with the higher and colder zone, is precipitated as rain in the lower valleys.

In the Khasia Hills 600 inches of rainfall have been recorded in one year, 250 inches of this being in one month. This is quite local, as 30 miles south with a mean temperature of 80 deg. and a mean minimum temperature of 60 deg. F., the annual rainfall is less than half, while in some parts of Assam it scarcely exceeds 100 inches.

Dendrobiums are abundant in these districts, growing chiefly on trees in the forest jungle at various heights from 10 feet up to 50 feet, but always above the low dense undergrowth, where they are exposed to the influence of the atmosphere. On the plains of Burma the temperature frequently rises to 110 deg. F. in the shade, but the average mean temperature is not much above 80 deg. F.; the annual rainfall is from 100 to 150 inches.

On the Arracan mountains, in localities where *Dendrobium crassinode* and *Dendrobium chrysotoxum* grow, the temperature is 75 deg. F., although on clear nights by rapid radiation it descends to below 50 deg. F., just before sunrise. At this elevation rainfall is about 90 inches.

Moisture is always great in the Moulmein and Arracan mountains, on account of the mists and clouds. In the north of Australia rainfall is more restricted, greatest precipitation is along the East Coast, and rainfall rarely exceeds that of England.

● Oyster shells are a valuable source of lime for Orchids that need it. Break them up into a fine powder. If left in coarse pieces the nacre seems to retard assimilation, while burning them makes the lime more soluble.—P.A.G.

Mr. Joseph Shaw, of Burleigh Heads, South Queensland, writes:—

● "What about taking us for a 'literary' tour around the collections of the Queensland and New South Wales members. Here is a suggestion. There is nothing more exciting to a true enthusiast than viewing or reading about different collections for the first time. What a lot there is to talk about, both in praise and criticism. One meets old friends, some doing much better than others, or a few not doing nearly as well as they should be. I always consider such visits both pleasant and profitable. There is always something new in the way of mounting, compost or novelty, also Orchids one does not possess. Viewing them growing, an opinion can be formed as to their desirability and an 'itch' to acquire them is very often the result.

We all look forward to our copy of the Australian Orchid Review, and more so if it is overdue. Furthermore, we all sympathise with the Editor in his difficulty in finding suitable material to fill the pages.

All members of five years or more standing, or possibly someone with a descriptive pen, could be induced to visit and write for the Review a brief summary of the older collections, say a column about each. Surely six or eight (half from each State) could be gathered for each issue. This would fill at least two pages and would be eagerly read. This feature could go on almost indefinitely.

As the older growers are exhausted, the younger ones would become eligible, and readers over a period would have information about all the most popular Orchids, as well as conditions under which they flourish.

Items of interest would be: The type of house; the owner's favourite Orchids; the general layout, and novelties.

I do not think that members would object to having their collections advertised or their names published. Certainly not, if they get the pleasure that I do when another member comes to visit me. Trusting my suggestion will meet with a favourable reception."

EDITOR'S NOTE.—As it is obviously impossible for the Hon. Editor to carry out these suggestions, readers are invited to submit descriptions of their own or friends' houses and collections. These need not necessarily be exhaustive, the salient points only receiving notice, so that growers can compare the various methods and results. Mr. Shaw enumerates several items that could be taken separately.

Relation of Light to Greenhouse Culture

● "Light has an important influence on the configuration of plants. Since most of the plant energy is derived from the air through sunlight, the optimum light conditions are important, and there is a marked difference in plants as regards their light requirements.

"During the short winter days many greenhouse crops do not obtain sufficient light, therefore any factor in greenhouse construction which will increase the amount of light is important. Lack of light is responsible for many greenhouse diseases; on the other hand, too intense light may prove harmful in some instances. The old type of greenhouse was crude in construction, especially as regards light. The modern tendency is to build larger houses, to use stronger material casting less shade, and larger and better quality glass. Large houses can be constructed relatively more cheaply and managed more easily because there is less rapid change of atmospheric conditions, etc., which helps to eliminate many greenhouse troubles.

"Morning light is more intense than afternoon light, our experiments showing a difference of 10 per cent. for some months. This difference is not constant from day to day, from month to month, or from year to year. The difference between morning and afternoon light has a practical bearing on the location of greenhouses as regards points of compass. The location of a house as regards points of the compass has a bearing on the practice of spraying plants, the yield of the crop, and to a certain extent on fungus infection.

"The difference in morning and afternoon light may be shown by various chemical methods, as well as by the growth of trees, and of crops of cucumbers in north and south houses. Other things being equal, a crop will show greater development on an east than a west exposure.

"An irregular surface, bubbles, etc., in glass, act as lenses and affect the even diffusion of light. New glass is slightly superior to used glass. The deterioration from dirt and other factors is much less than 1 per cent. per annum. The more nearly the angle of the roof coincides with the right angle of the sun's rays the more light is transmitted. Relatively steep roofs are superior to flat roofs for transmitting light. Records made in February show that a house with a roof angle of 46 degrees gave 18 per cent. more light than one with a 32 degrees angle roof. The reflection of light from surfaces varies greatly. In our experiments we found aluminium bronze to constitute the best reflector of light.

"The practice of lapping glass causes some loss of light, an average of 11 per cent. in our tests. There appear to be no important differences in the light of a greenhouse at different distances from the glass, practically the same light being obtained at 5 feet as at 30 feet. The light to be had directly under the glass, however, varies in intensity owing to the irregularity of the surface.

"The loss of light from glass may vary from 13 to 36 per cent. or more, depending on the quality and condition of the glass, and many other factors. Double glazed houses are much inferior to those glazed with a single layer of glass."—*Extracts from "The Orchid World."*

A Pestiferous Ballad

J. MURRAY COX, *Brisbane*

A cockroach, a beetle, and a little yellow bug,
Some thrips, a microbe, and a nasty slimy slug,
All met together 'midst the plants of Mister Mug,
And oh boy! did they have any fun?

They laughed, they joked, and they gobbled up a shoot,
Then nibbled pensively at a nice young root;
They polished off ten buds, and didn't care a hoot
For the damage they had done!

The slimy slug stood up, and said, "I have a toast
To the man who's so kindly acting as our host,
He may have less brains, but he's nicer far than most
To bright young lads like me!"

The Orchid cultivator rose at early morn
And found that all his choicest plants were badly shorn.
Said he, " 'Twere better that ne'er I had been born,
But now just let us see!"

He went to his chemist at a very rapid rate,
And bought the ingredients for a tasty bait.
Then he took these home and mixed them on a plate,
And spread it round his plants!

The cockroach, the beetle, and the little yellow bug,
The thrips, the microbe and the nasty slimy slug
Met that night and gave themselves a hug—
And the bait a greedy glance!

They chewed up the bait, then licked their greedy lips;
Each got a pain and clutched its aching hips,
All rushed for the water and gulped some thirsty sips,
And alas! they turned up their toes!

The slug and the beetle are well and truly dead,
And the cockroach's widow is nearly off her head,
While the bug and the microbe have hearts that feel like
lead,
And a strangely rigid pose.

Now, though those nasty pests will roam no more,
The fact that they're dead will not the loss restore,
And poor Mister Mug's still feeling very sore,
And his life is one long growl.

By exercising caution and a modicum of bait,
You may save your plants from such a grisly fate.
So get busy now, don't leave it all too late;
Slugs are ever on the prowl!

The Queensland Orchid Society

Sixth Annual General Meeting

● The Queensland Orchid Society held its Sixth Annual General Meeting at the Society's Room, Boundary Street, Brisbane, on Friday evening, February 9, 1940. There was an excellent attendance of members. Some very fine plants were tabled, particularly in the *Cattleya* type, although, as a result of the recent tempestuous weather, the number of plants shown was somewhat less than usual, but, withal, a fitting termination to six years of progress.

In moving the adoption of the Annual Report, and Accounts, the retiring President, Dr. D. A. Herbert, referred to the particularly happy nature of the year that has passed. Nothing had occurred to disturb in any way the harmony, and good feeling, which exists among the members of the Society, the meetings having been well attended. The quality and quantity of the blooms and plants shown had improved considerably, and the financial position of the Society was sound. Dr. Herbert attributed the improvement in the monthly shows to three factors, namely, that the number of growers had increased, that the number of plants in individual collections had been augmented, and that better methods of culture had been adopted as a result of the publication of the Australian Orchid Review, and the Cultural Table of Orchidaceous Plants issued by the Society. He paid a generous tribute to the work done by the Committee, the Honorary Treasurer (Mr. J. R. Tanner), and in particular to the Honorary Secretary (Mr. T. C. Harveyson), who has continued to show that amazing energy, efficiency, and enthusiasm which have characterised his work during the years he has held that office.

The standard of the monthly lectures has been well maintained, and this has added to the interest in, and enjoyment of, the Society's meetings.

The Report and Accounts were adopted without dissent.

Officers for the ensuing year were elected as follow:—

Patron: His Excellency the Governor, Sir Leslie Orme Wilson, P.C., G.C.S.I., G.C.M.G., G.C.I.E., D.S.O. President: J. Murray Cox, Esq. Vice-Presidents (Metropolitan): Messrs. V. W. A. Moller, A. P. Blair and L. F. Hayes; (Rural): Messrs. W. F. Tierney (Cairns), H. I. Wooster (Townsville) and J. Shaw (Burleigh Heads). Hon. Treasurer: J. R. Tanner, Esq. Hon. Secretary: T. C. Harveyson, Esq. Hon. Technical Adviser: C. T. White, Esq. Committee: Messrs. N. C. Campbell, W. L. Haencke, A. Bensley, F. E. Todd, J. Smolenski, H. Jamieson, M. R. Fox and C. A. Hilsden.

As Mr. Cox, who had acted as Hon. Auditor for some years has been elected President, it was decided to ask Mr. A. Higgins to act as Honorary Auditor for the year.

Four new members were elected to membership of the Society. In moving a vote of thanks to the retiring President and officers, Mr. J. M. Cox referred to the sterling nature of the work done by those in charge of the Society's affairs during the past year. He said that much of the happy spirit which had prevailed was due to the cheery good nature of the past President, whose ready humour, and wide knowledge of botany, have made the monthly meetings enjoyable, and valuable to members. Mr. Cox traced the history of the Society back to its earliest days when the members did not exceed a score in number, attributing its uninterrupted success to the great work done in the early days by the first President (Mr. E. J. Beard) and the first Secretary (Mr. V. W. A. Moller), who had laid the foundations so ably built upon by the succeeding Presidents (Messrs. M. R. Fox, M. P. Campbell and Dr. Herbert) and the present Secretary, ably assisted by the succession of the members who had served on the Committee.

The newly elected President said that all the enthusiasm and labour of a Society's officers would be futile if it were not backed by the sympathy, support and co-operation of the members. This support had been most generously afforded in the past, and he trusted that in the ensuing year it would be accorded to the new officers.

The motion was supported by Messrs. Campbell, Harveyson, Hilsden and Hayes, and carried with acclamation.

Radiation from Hot Water Pipes

● The air, by direct contact, receives a small amount of heat from the hot-water pipes; it must be radiated, or given off. One may often have heard a remark to the effect that although there are plenty of pipes in the house, which are always hot, yet the temperature of the air is never as warm as it should be. This is an interesting point. Those who have been up in a balloon, or a flying machine, have noticed that the atmosphere gets colder and colder the further they go away from the earth, yet at the same time they are getting nearer to the sun. This is because the rays of heat always pass through the air without affecting it; it is only when they come in contact with heat-absorbing substances that these bodies are gradually made warm. The air is warmed by direct contact with these heated bodies.

It will, therefore be seen that it is absolutely necessary for the pipes to give off rays of heat which, when coming in contact with heat-absorbing materials in the house, will warm them; these warmed objects will then warm the air in direct contact with them.

Now this radiation does not depend on the material of the pipes, but entirely on the nature of their outer surface or skin. If the pipes were made of silver, a metal of high conductive but low radiative power, they would, when feeling extremely hot, radiate or give off very little heat. If these silver pipes were polished, still less heat would be obtained from them. This is because silver is a bad radiating material. *Lamp black* is one of the very best and most suitable radiating materials. If the silver pipes are coated with this substance we have the finest conductive material radiating, or giving off, heat in a very efficient manner.

Cast-iron pipes come very near to those of silver, but even with these a great deal will depend on whether the surface is rough of polished. If in the latter state poor results are bound to occur, but if coated with *lamp black* the radiating power will be greatly increased, and a corresponding rise in the temperature of the house will be produced.

Therefore, it will be plainly seen that in order to allow the heat of the water to manifest itself on the outside of the pipes these must be made of a material having a high conductive power; and secondly, the surface of these pipes must be in a suitable radiating condition or the heat will not be given off into the house.

Notes on Repotting

● The proper time to repot a *Cattleya,* or, for that matter, most epiphytic Orchids, is often a vexed question with amateurs. No definite date can be given, for every plant must be taken in hand separately and treated according to its requirements. When the new bulb reaches a certain stage of advancement, fresh roots will push forth from its base, and it is just when these are visible that the most favourable time for potting occurs. Should the plant receive any shock during the operation, it will not have many days to wait until the roots enter the new compost and restore the plant to its former position of health. It will thus be seen how very detrimental is the method of potting a plant several weeks before the new roots appear, for an equal period must elapse before the plant has a chance of recuperating itself.

The roots of most Orchids are stiff and brittle and will not allow of much bending; any attempt to induce them to grow in a certain direction must be done with great care, or considerable injury may be done. For this reason it will be unnecessary to explain what a bad practice it is to leave Orchids which require repotting until the new roots have grown to a length of several inches.

Another difficulty with which amateurs are often troubled is, should a plant be repotted when it has a flower sheath, or should the operation be deferred until after the blooms are cut? The common practice of bygone days was never to repot a plant until after flowering. Good cultivators often now break this old rule and treat the plants according to their condition. If the specimen has been well cultivated in the past it will generally be found that the old ball of compost is in a sound and sweet condition, and all that is then required is a small quantity of fresh compost for the new roots to enter as soon as they emerge from the newly made bulb.

In many cases this new bulb will be found near the edge of the pot, and in these cases it will be necessary to carefully place the old ball of roots and compost into a clean pot just large enough to allow about an inch of fresh compost being worked in on the side nearest the new bulb. The roots will then freely enter this and greatly help in strengthening the flower spike. Plants treated in this way will suffer no harm what-

(*Continued foot of column* 1, *next page*)

Potting

(*Continued from Vol. 4, No. 3, page 93*)

Remove any back bulbs beyond three or four from the leading eye, as these will usually be found without live roots, and taking nourishment from the young growth; or, as a well-known expert has described it, these back bulbs are the poor relations of the family.

It will generally be found advisable to remove some of the compost from the back of the plant, and to carefully explore the centre, rejecting all sour and pasty material; seedlings and small healthy pieces may be transferred without disturbance. With the back of the rhizome, or root stem, against the side of the pot, all new material should be placed in front of the young growth in such a way that the whole is periodically renewed. A common fault with beginners is the failure to pack the compost sufficiently firmly in the pot. A potting stick made from a piece of cane with a slanting cut at the end will be found of great assistance, pressing the material very firmly underneath the plant from the side to the centre, not downwards, adding fresh material as required on the outside of the ball. When completed the surface should be quite firm when pressure is applied; a final clipping will give a nice appearance.

A lightly-potted plant, being like a sponge, is very retentive of moisture and tends to sourness and stagnation; whilst the simile of a squeezed sponge indicates the condition in which the compost dries out readily and leads to sound, healthy root action.

A pot should be selected giving room for two new growths, and be filled one-third with crocks; overpotting must be carefully avoided, also the use of too great a depth of compost. If in doubt, err on the side of parsimony, which will generally be found of benefit to the health of the plant and pocket of the owner. This opportunity may also be taken to examine carefully for scale, to sponge the foliage, and renew faulty stakes and ties. The grower in charge will see that the water is applied sparingly at first, until it is seen that the new roots are growing freely, otherwise the compost will be soured and the roots lost. Some slight shrivelling of the bulbs frequently occurs after potting, but this may be mitigated by extra shading and a light spraying on bright days.

Odontoglossums may be potted to the best advantage in March, and those not then in suitable condition are best left until the early spring. New roots generally appear when the young growth is 2 or 3 inches high, and this period should always be selected. On account of the elevated and cool condition of their native abode, *Odontoglossums* resent any disturbance during the summer months, which would result in excessive shrivelling.

Attention may be given to *Dendrobiums* after flowering when the young growth has well started in spring; also the popular winter-flowering *Cypripediums*, under similar conditions but somewhat earlier in the year, when the days first begin to lengthen. Plants in a healthy state, and with room for development, may not require further disturbance for two years, but a small advance in the size of pot at more frequent intervals, is preferable to the use of a large quantity of new material.

The outgrown, sour condition often seen in plants in small collections is well known, and a sick plant is an unsatisfactory charge. By the time the long period of convalescence is over, a further move into a larger receptacle is probably needed, and the net return in bloom of good quality will be small. To keep a plant in good health a constant supply of new plant food is desirable, and with care little or no check will be experienced in potting. The time-honoured advice may well be repeated: Prevention is better than cure.

---

ever, while the flowers are often much improved in size and texture.

Now, there is the other side of the question to be considered. The old compost often gets into a sour and rotten condition, such that only complete renewal will carry the plant safely through another season of growth. This means that every root must be disturbed in order to remove the old compost, thus resulting in a severe check to the plant should it be in a growing condition. Now it is easy to understand how detrimental to the flower buds such drastic treatment must be. The safest method is to defer the repotting of those plants until after the flowers have faded.

Of course, the majority of amateurs wish to see their plants flower annually, and rightly so from their point of view, but there are not a few Orchidists who consider that good specimen plants do them more credit than poorly produced blooms. There is no doubt that plants which have their compost in such a rotten condition as to require complete renewal cannot really be in their full state of vigour and, consequently, the flowers will not be seen in their finest state of perfection.

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Volume 5 **June, 1940** No. 2

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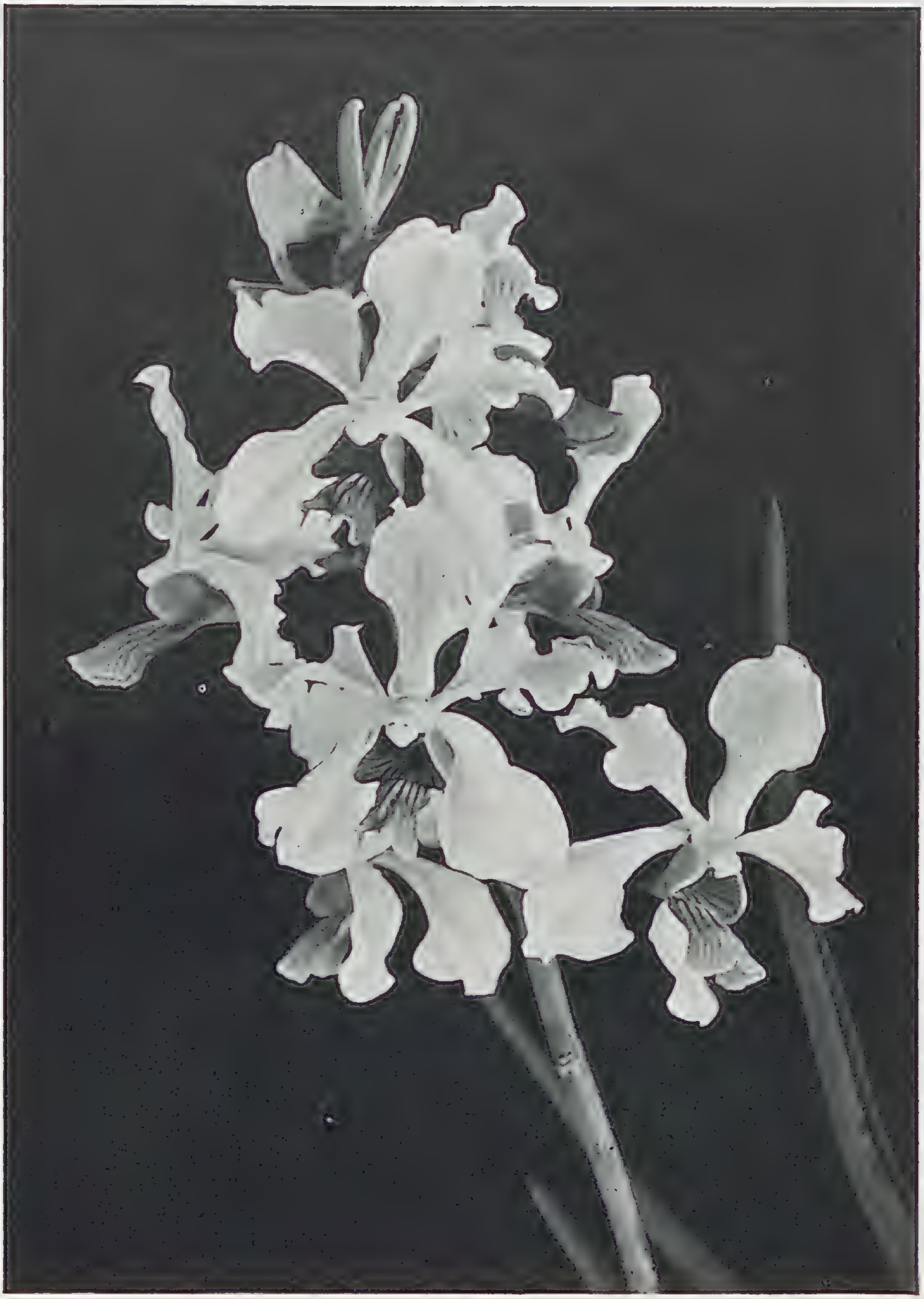


VANDA MARGUERITE MARON

See a description on page 44 of this issue.

Grown and photographed by F. Th. J. Nyland, Bandoeng, Java.

Australian Orchid Review

Editorial

The Fascination of Colour

● The field of recreational activity is extremely wide, but we invariably observe that intellectual recreation drifts towards the study of the beautiful in Nature. Hence, in the pursuit of leisure, the student tries to incorporate actual knowledge with natural beauty, giving preference to those divisions of Nature which comply more fully with his ambition. Thus, by the numbers who pursue any particular study, we are tolerably able to judge whether the subject is tinged deeply with the charm and fascination of colour.

For that reason there is no cause for wonderment why the brilliant butterfly has pre-eminence over other insect forms; why gaily coloured parrots, and delicately tinted finches, attract the admirer of gaudy plumages to the neglect of the more plainly feathered birds; or why the amateur Orchid grower prefers the marvellous blending of colour obtaining in the flower of a modern hybrid *Cattleya,* to that of a wild and diminutive form consisting of one colour.

Colour is a powerful factor in soothing or resting the eye, and bringing about contentment to the mind. But what causes us to seek an object with a beautiful colour pattern above one that is plain? The question is asked easily, but answered with difficulty, as the admiration of colour is not confined to the senses of the human alone, birds and animals also showing some extraordinary instances of appreciation.

Colour alone in Orchids, however, does not completely captivate; it requires some subsidiary presentment. It is the form in which the colour is presented, as well as the mass and its intensity. There is no blue Orchid which excels in gentian richness and beauty that of the simply shaped and colourful *Thelymitra ixioides,* or *T. venosa,* yet the cerulean blue variety of *Vanda coerulea* is held in high opinion owing to the combination of rare colour and exquisite form.

Furthermore, in the general popularity of the Orchid, we find enthusiasts studying it from all points, to which we can confidently say that no other Order of plants has received such a thorough examination as has the Order *Orchidaceae,* excepting, of course, those of immediate usefulness and economic value. When we get beyond the stage of admiring pretty flowers, the realm of biology begins to fascinate us, and thus, between the mere cultivation of Orchids to admire their beautiful flowers, to the study of the deeper problems of Orchidology, a growing number of zealots is provided with genuinely healthful pleasure, adding that variety to occupation which we all crave, and supporting Herbert Spencer in his insistence that "monotony no matter of what kind is unfavourable to life."

Suggestions for Beginners

His Honour, Judge H. F. MARKELL, *Warrawee, N.S.W.*

● In offering a few suggestions to the latest recruits to our ranks, I do not wish it to be thought that I am putting myself forth as an expert. As I become more experienced I am more acutely aware of how much I do not know. Still, one learns from experience, and the following suggestions are made in the hope that they may be of value.

One great difficulty encountered in Orchid growing in Australia, is that nearly all books on the subject are written regarding conditions which are entirely different from our own. We naturally look to England as the home of Orchid culture, and it is difficult to realise that much of the advice tendered in the text books in that country is not applicable here. The smallest consideration will convince that this is so.

Due to our hot dry summer, I think that the English type of glass house, with steeply pitched roof and relatively small cubic content is quite unsuitable in this country. Were I to construct a new house I should built it as big as possible so as to ensure a large volume of air. This makes for an even temperature, which is most important in our very changeable climate. Again, it affords the plants an abundance of fresh air, which is a great advantage. In cold climates it is not possible to allow plenty of air to enter the house in the winter, and, in this respect, we enjoy great advantages, because, except in cold, windy weather, it is possible to have the house open in the day time at any rate, pretty well the whole year round.

Orchidaceous plants dislike sudden changes in temperature. Where the most valuable specimens come from such changes are unknown, the only difference between summer and winter being the rainfall, the temperature being practically the same all the year round. Hence my liking for a large roomy house containing plenty of air.

The same reason applies to heating systems. I do not like electrical systems which allow air at a high temperature to pass direct into the house. Unless such systems are very carefully planned, so as to ensure that the air is thoroughly mixed and cooled before being admitted, great harm may be caused to the plants. I think the only satisfactory method of distributing heat in a glass house is by means of pipes containing water. The manner in which the water itself is heated is, of course, optional. The coke furnace is the one mostly used, but I think the ideal scheme is to heat the water electrically, the temperature being governed by a thermostat. It may be objected that this system is unduly expensive, but I do not think that this is so because the electricity is only used when needed, and the suppliers of power are willing to accept a very low rate per unit, something, I understand, in the nature of three-farthings. In any case, whatever means of heating be adopted, see that the pipes through which the water has to circulate are large in section. I should say at least 4 inches in diameter. In such case, on account of the large heating surface available, the temperature of the pipes can be kept low, and hot air in the house is avoided.

Apart from the construction of the house and the method of heating, I suggest that the most important items for consideration in regard to growing plants are: **Light, Shading, Humidity, Watering, Composts.**

Light.—This is all important if Orchids are to grow and flower properly. The difficulty which arises with most of us is that we try to grow all kinds of plants in the same house, and it therefore becomes a problem to devise means whereby plants which naturally grow in entirely different situations, can all receive the proper amount of light which they respectively require. This can only be determined by experiment, and perhaps the best scheme is to divide the house into sections. One, say, with practically clear glass for the sun loving plants, such as *Dendrobium Phalaenopsis* and those coming from New Guinea, the second with light shading, and the third considerably deeper. It is surprising what can be done in this way with a certain amount of jugglery, and a little observation teaches what is required by each species.

Allied to the matter of light is the determination of what method of shading should be adopted. There is considerable difference of opinion on this subject. I believe the ideal is blinds made of wooden slats, but they are so expensive as to be impracticable. Butter muslin on the inside of the glass is very good, as also is tea-tree shading on the outside. The latter is very cheap, lasting, and effective, and gives that patchwork or broken sunlight which is so beneficial. I do not favour blinds made of material such as unbleached muslin, because they supply diffused light, which in my opinion is not so good. I am inclined to think that the best and cheapest way to shade a glass house in this country is to construct light wooden frames covered with tea-tree, or very light scrim which can be fixed into position at the beginning of summer, and removed when the sun begins to lose its burning power. These frames are much cheaper and easier to manage than blinds; there is no hauling up and down, and they give, if properly constructed, a uniform broken sunlight. The glass underneath can, of course, be left clear, or further shaded as suggested above, but I believe that degrees of shading could be brought about by the use of butter muslin rather than by painting the glass or whitewashing it.

Humidity.—Most Orchids grow in very humid atmospheric conditions, and one of our troubles is to provide the necessary moisture in the house during the hot summer. It is advisable to cover the shelves with some moisture-retaining material, such as coke or coal ashes, and to keep this very wet on all sunny hot days. Personally, during such weather, I do not think it possible to put too much water into the house and the plants, the whole interior being hosed liberally, provided the right amount of light is given. I know of no plant which suffers from being watered overhead in such conditions. On the contrary, it is most beneficial. In addition, I believe one of the best ways of maintaining the right atmospheric conditions in the house is to keep it full of plants. Life begets life, and I think that a house which contains numerous foliage plants such as *Crotons, Dracaenas,* Ferns, etc., in addition to Orchids, has that "live" atmosphere which is apparent to the "old timer" the moment he enters it. On the other hand, so many houses containing Orchids only, have that dry arid smell which reminds me more of the Sahara Desert than of a tropical jungle.

Watering.—This is a matter upon which, like a cold in the head, one receives so much conflicting advice that bewilderment is the result. The golden rule is to water when a plant is growing and can use the liquid to advantage, and to be sparing when the contrary is the case. This rule, however, although easily stated and understandable, is by no means easy to apply, and its application mainly depends upon observation. Most Orchids which possess pseudobulbs have definite resting periods after flowering. These may be given plenty of water while in active growth, but when resting they should receive very little, so long as the bulbs are plump.

PLEIONE HUMILIS *Don.*

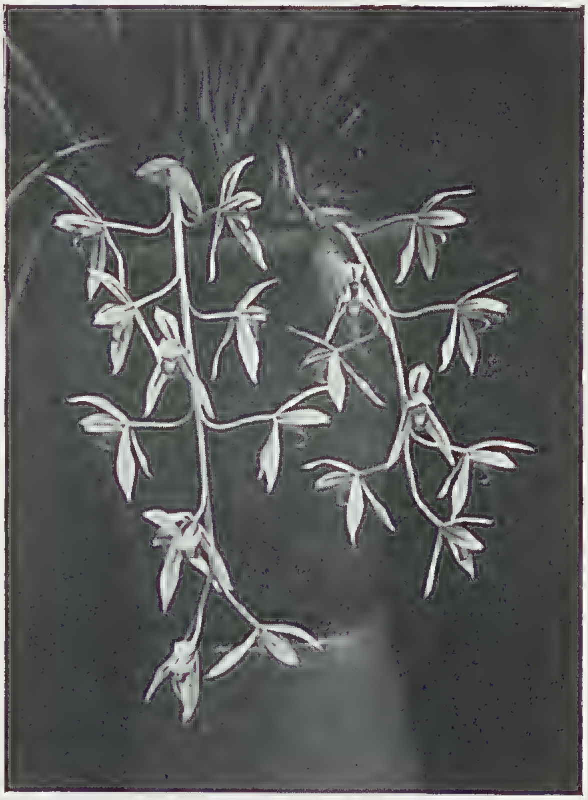
Blooms during winter; habitat Himalayas, 6500 to 8000ft. above the sea; requires cool culture. Flower, white, spotted with purple, labellum yellow striped with purple.

Grown and photographed by The Chandra Nursery, Sikkim, India.

Bulbless Orchids such as *Vandas, Cypripediums, Phalaenopses,* etc., must be kept damp at all times, provided the temperature in the house is high enough, but they should receive far more moisture during the growing season than when they are more or less dormant. No hard and fast rule can be laid down with regard to a particular case. So much depends on the weather, the amount of light available, and the condition of the plant itself, but probably the best method of attacking this problem is to first of all ascertain the conditions under which the plant grows naturally. If it comes from a locality where there is a heavy rainfall, it will require a plentiful supply of water during the growing season. If it is a plant which grows in a country where there is more or less rain during the whole year, it will probably appreciate a certain amount of water at all times, but in cases such as these it will be found that a maintenance of a humid atmosphere is probably more important than the actual watering of the plant itself. True epiphytes such as *Saccolabiums* and *Vandas* develop large aerial systems of roots, and it will be noticed that comparatively few roots are within the pots or other containers, which indicate that these plants derive most of their moisture from the air. On the other hand, Orchids with hard bulbs, and much smaller root systems, obviously come from places where there are definite rainy seasons and periods of comparative drought, the bulbs acting as reservoirs to tide over dry spells. Much can be learned in this way by observing the habit of the plant and the manner in which it grows, and, as our object is to copy the natural conditions as closely as possible, to act accordingly.

Composts.—For epiphytes, fibre is the principal medium used, and there are many types all of which have their adherents. However, I do not think that the particular type of fibre to be used is so very important. After all, the fibre is for the purpose of keeping the plant firm in its container and for holding a certain amount of moisture, and so long as it is of a kind that will not decay readily, does not hold an undue amount of water, and admits air freely to the roots of the plant, I think that any good type of fibre will serve. Personally, I prefer osmunda, but I have seen most excellent results from the use of other kinds. There is so called osmunda fibre which comes from Queensland which seems to be quite satisfactory. Perhaps it is not as lasting as that coming from Japan or America, but all plants which I have tried in it seem to grow quite nicely. As supplies of fibre from other countries at the present time are almost unprocurable, this is a matter of considerable importance. I do not like sphagnum moss in the compost itself because it decomposes quickly, and retains too much moisture during the winter. A light coating of moss on top of the fibre in the case of moisture loving plants seems to be an advantage, particularly if it can be kept growing.

Some Orchids which I am looking after at present have been treated in rather an unusual way. They are planted in pure fibre in pots, and between the fibre and the sides of the pots thin layers of moss have been wedged. The plants are growing and rooting particularly well. All Orchids send their roots to the sides of the pots and the moss thus placed seems to suit them, and, not being mixed with the fibre, it does not decay so quickly. In addition, this method will be found to afford a very satisfactory way of making the plant very firm in its pot without injuring the roots. If the Orchid is first of all worked into the pot with fibre it will be found that the moss can be pressed down the sides of the pot without in any way disturbing the plant itself. Although I have heard it said that Queensland *Polypodium* fibre is of no use, that is not my experience. I have used it quite extensively, with fibre in place of moss, with excellent results. In particular I find that *Lycastes* and *Cypripediums* do very well in it.



CYMBIDIUM ACUTUM *Ridl.*
Commonly known as C. Simonsianum, *Kg. Pntl.*
Flower small, sweetly-scented; the sepals and petals white with a crimson line; labellum white with yellow markings; habitat India (Assam and Tista Valley) up to 4000ft. (also Sumatra).
Grown and photographed by The Chandra Nursery.

● *Cypripedium Neptune* (*C. Io* x *C. Rothchildianum*) is one of the older hybrids, but well worth a place in collections. Its flower has many of the characters of *C. Rothchildianum*. Petals 7¼ inches from tip to tip; dorsal sepal 2¼ inches long and 2 inches wide; stalk 15 inches long, foliage mottled. This hybrid is flowered by Mr. R. McSkimming, of Lakemba, along with his *Cattleyas*, which receive artificial heat during the winter. In flower on 23/2/1940.

Pollination of *Angraecum sesquipedale. Thow.*

Mrs. EDITH COLEMAN. *Blackburn, Vic.*

● Comparatively little work has been done on the pollination of horticultural Orchids, probably because most growers are aware that pollinated Orchids fade more quickly than those which escape the attention of either hybridist or insects. And so Orchid growers are apt to miss what is perhaps the most fascinating phase of plant development.

In a small, cold glasshouse, containing three plants only of an Australian Terrestrial Orchid, I have counted twenty (20) insects of one species — a large attractive insect only rarely seen except by entomologists. Every flower was effectively pollinated. There were no other Orchids in the glasshouse, and this species does not grow in the locality; so it was probably quite unknown to the insects until this season.

Petunia Hawk-moth with proboscis uncoiled ready to dip into a flower.

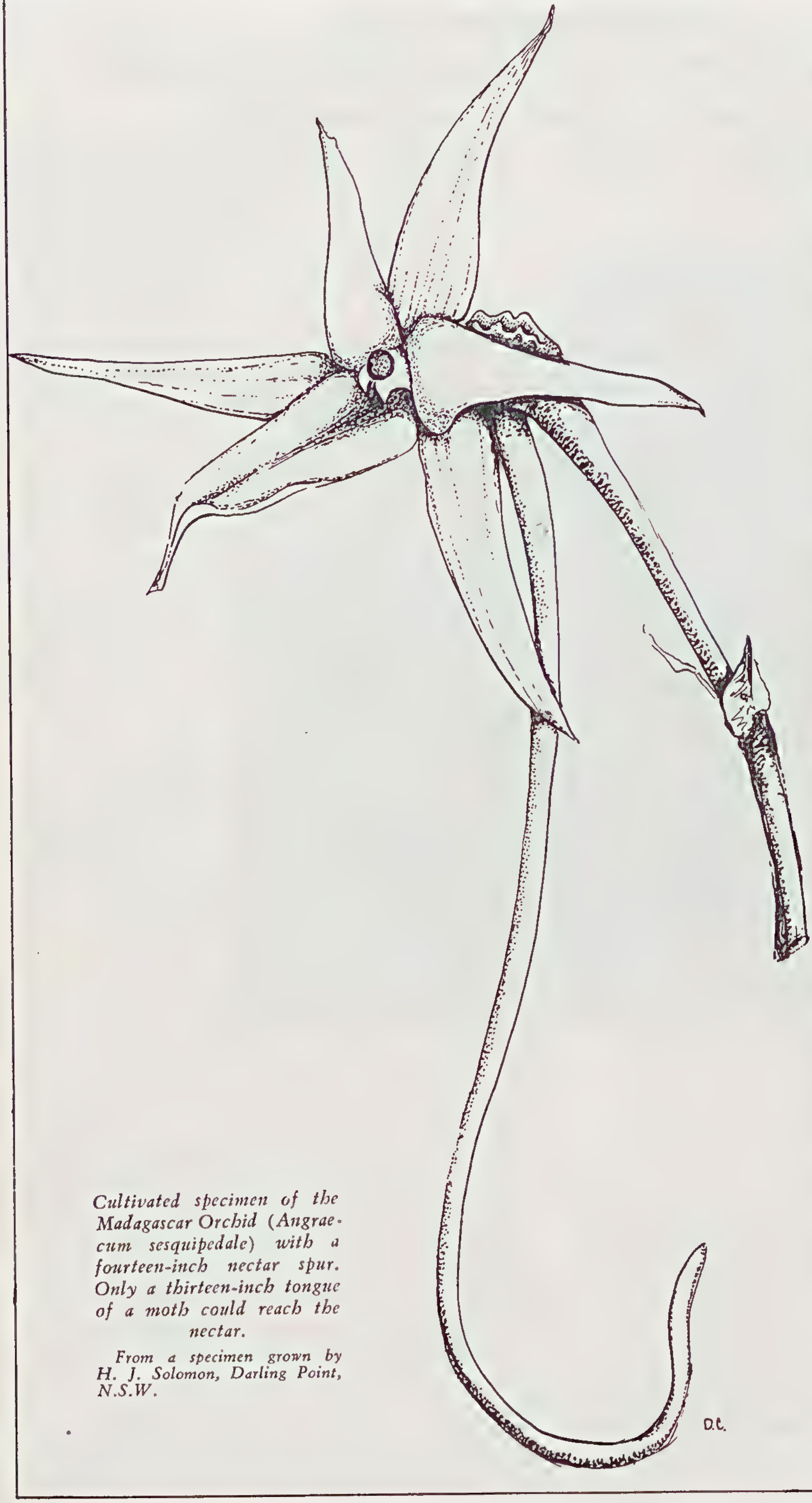
Photo by Mrs. E. Coleman.

Then there is always the chance of adding some new fact to what is already known of Orchid pollination, by growers who care to bestow the freedom of their glasshouses on the insect fraternity. The insects gained access to my Orchids through a broken pane of glass. An open door to a house in which exotics are blooming would surely lead the grower into the most fascinating fields of science.

It may be contended that the official pollinators of exotic Orchids have not been introduced into Australia. I venture to say that a percentage of other insects, native or introduced, would in time adapt themselves to the pollinary mechanism of most exotics.

There are several interesting features which distinguish Orchids from other flowers. One of these is their pollen. We are all familiar with the golden (sometimes red, or brown, or purple, or even green) grains of pollen that lie in the hearts of so many garden flowers — the life-giving element which must be conveyed to a stigmatic surface if the flower is to set fertile seed. We have seen, too, the golden dust caught on the bodies of bees, as they fulfil their mission of pollinating the flowers, while collecting pollen and nectar to serve their own communities.

But the insect which visits an Orchid is not dusted with pollen. Instead, one may see it bearing away a pair of little club-shaped masses, adhering, like horns, to its head, or some other part of its body. The golden horns are pollen-masses, removed perhaps from the last Orchid flower whose pressing invitation it accepted, and with which it will almost certainly pollinate the next Orchid flower whose sweets it decides to taste. For Orchids, as one expects from such floral aristocrats, have evolved much more striking devices to secure pollination than are to be seen among the *hoi polloi* of the garden. Instead of producing pollen in the form of dust, they have compounded the grains into mealy or waxy



Cultivated specimen of the Madagascar Orchid (Angraecum sesquipedale) with a fourteen-inch nectar spur. Only a thirteen-inch tongue of a moth could reach the nectar.

From a specimen grown by H. J. Solomon, Darling Point, N.S.W.

masses, so firmly welded together that they do not crumble until they have served their purpose.

A bee is thus able to transport hundreds of grains with few mischances.

As the pollen is not granular, it cannot be dusted over the insect.

The All-important Gland: So to facilitate their transport from flower to flower the masses are provided with a viscid gland, or "sticker," which fastens them securely to the body of a bee or other insect. It is most fascinating to see insects leaving Orchid flowers with, perhaps, as many as six pairs of these golden masses attached to them.

In some Orchids there is only one pollen mass attached to each gland. More often there are two, or four, or eight. Broadly, there are two kinds of viscid glands. In one of them the gland is covered by a thin membrane which keeps it moist and ready for action. The head of a bee, coming in contact with such a gland, bursts the covering membrane, liberating a viscid fluid which, in a moment or two, sets firmly, like cement. With a "sticker" of this type the insect must be delayed long enough for the viscid matter to "set"; and so, in Orchids provided with glands of this kind, we find nectar, or other palatable fluid, concealed between the tissues, so that a bee must first pierce the walls of the cells, and then patiently suck the moisture from intercellular spaces.

By the time the bee has supped, the "sticker" has set! She leaves the Orchid with its pollen-masses glued firmly to her body. Astute? Yes. And yet this is only one of an endless variety of such clever devices by which Orchids secure cross-pollination.

In the second type of sticker, the viscid matter is so tenacious that it clings, like rubber-solution, without hardening. There is thus no need to delay the insect while the viscid matter "sets." So in Orchids having this kind of gland the insect finds free nectar, lying in little "jugs" and "pitchers," into which it has only to dip an eager tongue.

It may sip, and leave the flower, almost without pause, carrying the pollen-masses away with it, glued firmly to its body.

Angraecum sesquipedale: The second type of gland has been evolved by the Long-spurred Angraecum of Madagascar.

Moreover, in this Orchid (which is winning the favour of Australian growers) is seen one of the most remarkable modifications in the whole of the plant world. Like many other highly specialized flowers, the *Angraecum* has evolved an almost incredible method of securing cross-pollination. Should its remarkable device fail to act, the Orchid must remain sterile, for its reproductive parts are so situated that self-pollination is precluded.

In this Orchid we find two glands, of the second type, in each flower, with a single pollen mass attached to each one. By lifting the lid of the anther one may see how snugly they lie in their cells, their stickers in exactly the right position to come in contact with the head of a visiting insect.

This brings us to the most astonishing feature of the *Angraecum*—its nectar-jar, in which is stored the sweet bribe which lures its pollinating agent. The base of the waxy petals has been modified into a cylindrical tube, no thicker than a pencil, to form a nectar-spur, which may be from 6 to 18 inches in length. As the gland is one which necessitates no delay of the insect, free nectar awaits it.

Most surprising is the fact that the supply of nectar reaches only to a depth of about an inch or so in the bottom of the spur. To offer nectar so deeply hidden to a short-tongued insect would be like the dinner-party arranged by the stork for the fox. Moreover, it can only be reached by an insect having a tongue long enough to probe to the bottom. What does that imply? Why, that in the natural habitats of *Angraecum sesquipedale*, as Darwin predicted, there must exist a moth with a proboscis long enough to drain the nectar, and thick enough to press against the "sticker," when fully inserted into the spur.

A very thin, short proboscis might easily enter the spur, but it could neither reach the nectar, nor press the sticker. In spite of the criticism which Darwin's prediction drew from botanists and entomologists, a moth with an eleven-inch proboscis was discovered, and soon others, with even longer proboscides, were recorded.

Through the kindness of Mr. H. J. Solomon, I was able, in July, 1938, to examine two fine flowers of *Angraecum sesquipedale*. The spurs were 11¼ and 11½ inches in length. They were neither twisted nor undulant as in other specimens I had examined, grown at the Adelaide Botanic Gardens. In one of them nectar reached a depth of 1½ inches. Free nectar also covered the inner wall for about 1 inch below the throat.

A few beads a little lower down were probably carried there by my dissecting blade. The rest of the wall was quite dry.

In the other spur, free nectar actually reached a depth of 3½ inches, some of which would thus be available to a proboscis 8 inches long. The walls of this spur were dry, and there was no free nectar at the throat. The extra amount of fluid was, doubtless, due to moist, glasshouse conditions.

In a natural state the *Angraecum* grows attached to the driest parts of tree trunks, on the edges of open forest country, in very dry localities.

The nectar at the bottom of the spurs was sweeter than that at the throat. The latter was not stigmatic.

The pollinary mechanism was in perfect condition even after a long journey by post. It was fascinating to watch the narrow, transparent gland curl round the needle as I withdrew each pollen mass. I was not successful with a dissecting-needle, but a thick knitting-needle pressed the rostellum, ruptured the membrane, and released the pollinia.

Angraecum sesquipedale is rare in Australian glasshouses. I am greatly indebted to Mr. Solomon for affording me an opportunity to examine such beautiful specimens. The nectar in these flowers could, of course, be reached by a moth with an eight-inch tongue. But an eight-inch tongue is by no means short! Moths, as we know, carry their tongues, when not in use, coiled like watch springs. To sip nectar the tongue is uncoiled and dipped into a flower.

The tongue of Darwin's moth was coiled into a spiral of twenty windings.

By watching the hawk-moth at dusk, as it pollinates the petunias of our gardens, one may gain some idea of the beauty and wonder of the *Angraecum's* pollination.

The hawk-moth hovers momentarily above a flower. Without alighting, it uncoils and dips its tongue into the petunia. It is done. The moth has sipped. The flower is pollinated.

Even so does the *Angraecum* moth uncoil its 14-inch long tongue to sip from the depth of a 15-inch spur.

Such pictures as this should be seen at dusk in the glasshouses of those who cultivate long-spurred Orchids—provided, of course, that open doors do not unduly lower the temperature of the house.

"Spotting"

Excess of moisture causes the formation of drops of water on the glass and sash-bars. This condition of the atmosphere usually occurs during cold weather, especially at night-time, and, if not soon remedied, the plants are subjected to a continual falling of drops of cold water upon their leaves, flower sheaths, and tender new growths. This, known to every Orchid grower as "drip," is extremely detrimental, for it occurs when the atmosphere is already in an almost saturated condition, and with little chance of drying.

Where plenty of room is available, the plants may be arranged so that the drip, if formed, may fall between them. In small collections circumstances will not allow this method to be carried out, but in both cases prevention is better than cure. It has been previously shown that cold coming in contact with moist atmosphere causes some of the moisture to condense; by covering the roof of the Orchid house with some protective material on cold nights, much of this condensation may be prevented. It will be well to mention that water falling from a recently watered suspended pan, or basket, is not so detrimental, for it only occurs when the conditions of the atmosphere are in a right state for watering the plants, that is, when the air is moderately dry, and an excess of water is quickly evaporated. Therefore, it will be seen, there are two distinct kinds of "drip," one, caused by condensation of the atmospheric moisture due to a lowering of the temperature; another, due to careless watering. The former is detrimental and requires every means of prevention; the latter, although far less harmful, should, and can, easily be avoided.

A highly saturated atmosphere will do little harm to Orchids so long as the temperature remains comparatively high; but great danger to the plants is incurred by allowing the temperature to fall, and remain at a low level when the atmosphere is charged with an excess of moisture.

Vanda coerulea delights, during the day-time of the growing season, in a very damp and hot atmosphere, but if the temperature is lowered without disposing of the moisture, spotting of the leaves will surely result.

Boxall, when collecting *Vanda coerulea* in the southern Shan States, frequently had to contend with extremely hot, humid days, yet at night-time it was so cold that hoar frost was formed on the ground, and very often on the plants themselves. He, however, always noticed that, before the arrival of the cold and frost, keen drying winds came and carried away almost all the moisture in the atmosphere; the plants, therefore, never suffered from the effect of a saturated atmosphere at a low temperature.

"Spot" on the leaves of Orchids may be attributed to an unnatural, or excessive amount of atmospheric moisture when the temperature is low, and the plant is fully charged with water.

It was found impossible to produce "spot" on plants which had remained in a dry place for two or three days, or in those scantily supplied with water or kept in a low temperature. The Orchid disease known as "spot" is of non-parasitic origin, the initial cause being the presence of minute drops of water on the surface of the leaves at a time when the temperature is exceptionally low, and the roots copiously supplied with water. "Spot" in the broadest sense of the term is, in the case of cultivated Orchids, mainly, if not entirely, caused by the three following conditions:—

(1) too high a temperature;

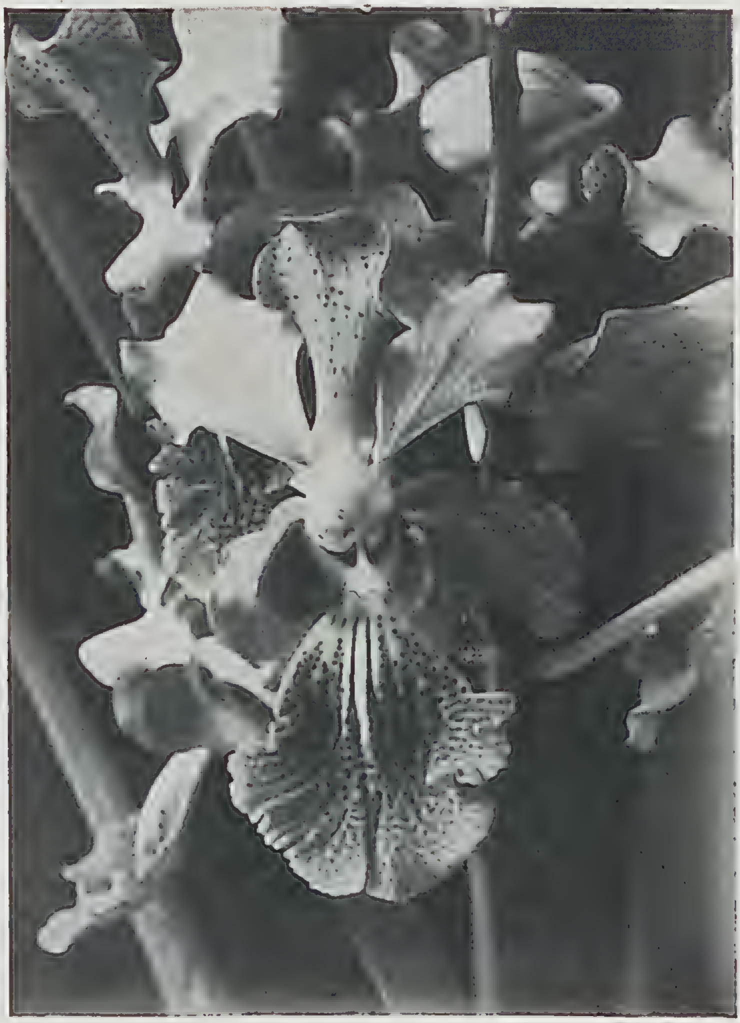
(2) too much water, and not sufficient air in contact with the roots;

(3) watering or spraying with a falling instead of a rising temperature.

Semi-Terete Vanda Hybrids

F. Th. J. NYLAND. ***Java*** **Editor, "*Anggrek Boelan*", Java**

● At present a lot of fine hybrids are grown in Java, which are the results of crossing the terete *Vandas* with flat-leaved species. All *Vandas* of this group have deeply furrowed, V-shaped leaves, long and pointed. These hybrids are known as semi-terete *Vandas*. Like all members of the terete group, they thrive in full sunshine. The flower spikes start from the upper parts of the plants, and carry clusters of beautiful, large blooms, which are decidedly showy and long-lasting.



VANDA LA COQUETTE
Grown by F. Th. J. Nyland. Photo by D. O. L. Cornelius, Bandoeng, Java.

The first semi-terete *Vanda* hybrid was raised in 1903 from *V. suavis* x *V. teres*. Some 30 years ago Mr. W. van Deventer, who was living in Java at that time, crossed *V. tricolor* x *V. teres*, from which the famous *V. Emma van Deventer* was produced. So *V. Emma van Deventer* is the first Java hybrid of the semi terete group.

Extensive hybridizing of *Vandas* during recent years has resulted in an interesting group of free-flowering hybrids.

Mr. J. Van Brero has several beautiful *Vandas* to his credit. One of the first he made was *V. Josephine van Brero,* which has as parents *V. insignis* and *V. teres longalabia.* The flowers are of a delightful pinkish-red with darker veining. *V. teres longalabia* has also been used as a parent in *V. Emma van Deventer var. Tjipeganti.* The other parent is the well-known Javanese *V. tricolor.* It has lilac pink flowers, heavily mottled with red-brown spots; the lip is brownish purple with yellow stripes. The flowers are more than 3 inches in diameter. *V. Madame Dinger* is also a popular *tricolor* hybrid; the other parent is *V. Miss Joaquim.* The flowers are of a soft, rosy colour, heavily spotted with small crimson dots. The lip is beautifully marked with purple and orange.

In *V. tricolor pallida* we see a white - flowered form of *V. tricolor*. *V. La Madonna* is a cross between this variety and *V. teres alba*, and has soft, pink flowers.

One of the finest *Vanda* hybrids which has been raised by Mr. J. van Brero is *V. Majestic* (*V. coerulea* x *V. teres aurorea*). The petals and sepals are rose-violet, and the lip inclines towards blue. The flowers are nearly 4 inches in diameter. Not so long ago I had *V. La Coquette* (*V. insignis* x *V. Hookeriana*) in bloom. It has red-purple flowers measuring 3 inches across, the lip is of the same colour, speckled with dark purple spots.

A distinct hybrid in the semi-terete group is

V. Mevr. L. Velthuis, which is obtained from *V. Sanderiana* and *V. Miss Joaquim*. The flowers are 3½ inches wide and of a rosy violet colour.

V. Marguerite Maron is known as a popular hybrid. Mr. G. L. Wijnen Riems has raised a new variety of it named *Mimosa*. Instead of the common *V. teres*, the fine variety *Little's Giant* has been used as the male parent. The flowers are 4 inches across; the segments are pink with purple spots. The lip is richer in colouring that the common *V. Marguerite Maron;* the colour is greenish-yellow with red-brown stripes.

Every one of the above-mentioned hybrids is cultivated here for cutflower-purposes, and all are very attractive.

● *Dendrobium Tofftii*, Bail., was first discovered during the eighties, in Nind's Creek, about a mile down the Johnstone River (Innisfail, N.Q.) by Surveyor Tofft while surveying. He informed his men to be at a "landing" in the evening to pick him up. It was getting late and, becoming angry at no men or boat there to meet him, suddenly remembered that he did not mention which landing place to pick him up at. Departing to go to the next "landing," he sighted a beautiful flower in front of him. He gathered the flowering plant, which was described, and named in his honour.

The pseudo-bulbs attain the length of 10 feet, are dark in colour, the leaves being slightly different to those of *D. undulatum*. The raceme has up to 65 or more flowers, which are white with violet lines. Insects pollenize the flowers, which seem to set rather freely, as the species is a heavy seed-pod carrier. I have never seen an "aerial" on a plant yet. The species grows in swampy country liking heat and moisture. Some of the habitats are Nind's Creek, Waugh's Pocket, Russell River, Daintree River and Bailey's Creek. It grows on mangroves.

—W. F. Tierney, Cairns, Nth. Qld., 11/3/1940.

● Mr. W. H. Nicholls writes:—

"Through inadvertence I missed reading the article by P. A. Gilbert on *Dendrobium linguiforme*, Swartz, in the December issue of 'Australian Orchid Review.'

"Looking through this copy recently I became interested in Mr. Gilbert's remarks concerning the typical form and also Bailey's variety, *Nugentii*.

"Certain references appeared somewhat an invitation to prove my statements or rather the size of the individual leaves of variety *Nugentii* as reproduced in 'The North Queensland Naturalist' for September, 1939. Before I say further, I have to admit the figures referred to were inadvertently reproduced *above* natural size, or perhaps it would be more correct to say, above the size wished for by the writer.

"The plate represents the typical form and Bailey's variety. I have grown both forms for some years and find the variety easier to manage, and in my opinion also the most attractive when in bloom.

"My initial acquaintance with this truly charming form was in 1937 (?) when Mr. Alex. Burns, of Blackburn (Vic.)—so well known to Orchid growers—showed me a plant which he collected on the shores of Lake Barrine, near Yungaburra, in North Queensland.

"The leaves of Mr. Burns's plant were remarkably large and rugged (as I have pictured them in the aforesaid plate)—as large as I have yet noted in variety *Nugentii*.

"The drawing in 'The North Queensland Naturalist,' already alluded to, is quite a good representation of the character (and size also) of the *foliage* of Mr. Burns's plant. My own plant of this variety came from the Ravenshoe District in North Queensland, it being sent to me by Dr. H. Flecker, of Cairns.

"The individual leaves of this particular specimen—which I have before me as I write—are variable as to dimensions. Some few leaves attain a length of exactly 35mm., the majority, however, being 20-25mm; the width varying from 15-20mm.—in the majority of course—a few exceptionally well-developed leaves reaching a width of 25mm.

"I am sure the size and condition of individual leaves is governed by the conditions prevailing during the growing period.

"The largest-foliaged plants of typical *D. linguiforme* I have seen were *in situ* on *Casuarinas* near the mouth of the Brunswick River in Northern New South Wales; in direct contrast to specimens received from Boonah in South Queensland. The leaves of the former were as large as in variety *Nugentii;* the latter averaged 1.3 cm. only in length.

"If readers of 'A.O.R.' would like the plant of *D. linguiforme* var. *Nugentii*, I am willing to exchange same for other Australian forms—either epiphytal or terrestrial forms. My address is 35 Ballarat Road, Footscray, W11, Victoria."

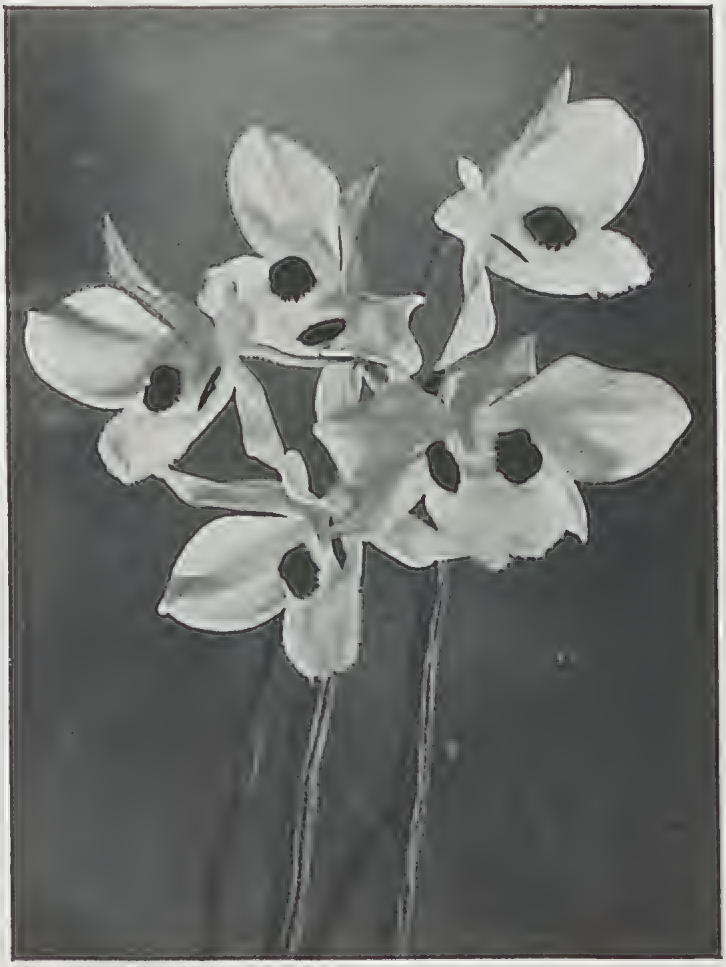
Notes on Dendrobium Culture

P. A. GILBERT, *Lakemba, N.S.W.*

● *Dendrobiums,* from the Himalayas and other high altitudes in India, must have decided periods of rest and growth. It is quite necessary for the production of a good crop of flowers that they should make strong pseudo-bulbs, and it is equally essential that these growths should be well ripened. Some *Dendrobiums* are best grown in pots with perfect drainage, while others do best mounted on blocks of staghorn fibre. Nearly all of them should be placed in the hothouse during their periods of growths, as they require a high temperature, a moisture-laden atmosphere, and a plentiful supply of water at the roots while they are making their growths, the moss and compost never being allowed to get dry, these remarks applying to December, January, February, and March around Sydney.

After the growths are finished, they may be allowed a good season of rest by moving them into a cooler house, the periods of rest depending on the habits of each species. During this time they must have very little water, only just enough to keep the pseudo-bulbs from shrivelling. When they begin to make new growths in the late winter and early spring, they should be moved back into the hothouse, and treated as above. Most species begin to grow after their flowers have faded.

Dedrobiums are propagated in different ways. Some of them form plants on the old stems, which should be cut off and potted when they commence their new growths. Others are multiplied by cutting the old stems from the plants after blooming, laying them on the moist surface of a pan of sphagnum moss, which induces them to break at the nodes or joints. Many are increased by dividing the plants as they begin to grow, or when they are at rest. After cutting when at rest, put them in some shady part of the house without receiving much water either at the roots or overhead until they begin to grow, then they can be separated, potted, and have the regular treatment.



DENDROBIUM PULCHELLUM, *Roxb.*
Also known as D. Dalhousianum, *Roxb.*
Five flowers on one spray, each flower 4 inches across. Blooms October to December; habitat Himalayas to Burma; requires stove or glasshouse treatment.
Grown by D. Schlinker. Photographed by G. Hart.

● At the February monthly meeting, Mr. T. H. James exhibited two perfect flowers of *Stanhopea Wardii.* "One of the most beautiful of the species, remarkable for its brilliancy, and for the delicious sweetness of its flowers" (Williams).

Some Orchid Pests

A Short Account of their Life Histories and Control

W. A. SMITH, ***Brisbane, Q.***

● The list of insects and their relatives associated with Orchids is a large one, and the Orchid grower, in common with the less specialized horticulturalist, is seldom without one or more pests to contend with. When a pest threatens to ruin, or severely detract from the beauty of a valuable collection of Orchids, surely it is worth while to spend whatever time or money is necessary to control or eradicate it. There are very few insects attacking Orchids against which there is no counter attack, and provided control measures are conscientiously carried out the damage can often be greatly minimized.

CYPRIPEDIUM NIVEUM *Rchb. f.*
var. alba
See a note in this issue.
Grown by C. Harveyson. Photographed by Dorothy Coleman.

I propose to discuss these pests, information about which has been gathered from various sources, under the following headings:—(a) general feeders; (b) sap-sucking insects; (c) a few overseas pests; and will conclude with some remarks on general control measures. Quite often a knowledge of the life history, or life cycle, of an insect will assist, when you want to know just why or when any method of control will be successful, and where possible I will spend a little time discussing their life cycles.

GENERAL FEEDERS. The Orchid Beetle (*Stethopachys formosa Baly.*), one of our native insects has, unfortunately, a large capacity for damaging both native and introduced Orchids. The adult, which will be familiar to many of you, is a black and orange beetle. The female is approximately ⅓ of an inch long, and the male is somewhat smaller. In appearance, they rather resemble the common pumpkin beetle, and in fact are closely related to it. The pumpkin beetle, however, does not attack Orchids.

During the spring months, the adult female lays her eggs in the leaf axils, in the flowers, or in any similarly sheltered places available. A week or two later, the tiny, cream-coloured larvæ emerge and proceed to feed on the young leaves, the flower buds or flowers, and in the growing tips. From the growing tips the larvæ often tunnel down into the stems or bulbs and here lead a sheltered life while doing a great deal of damage by feeding on the internal tissues of the plant. On the leaves and flowers the larvæ will erode one or both surfaces by chewing the soft tissues, and often leave only a skeleton of veins.

After feeding for a time, the skin of the young larva splits up the mid-line of the back and drops off. Before the new skin has had time to harden, the insect increases in size, and so enters the next larval stage. This phenomenon, which occurs several times in the life of the larva, is known as moulting, or ecdysis. Moulting is necessary for growth in an insect, because the tough chitinous skin with which it is covered has little elasticity.

The mature larva usually retires into an old stem or into the compost on which the plant is growing, and there pupates. The pupa, or chrysalis, is shielded by a white cocoon, from which the adult beetle ultimately emerges. The beetle itself may be responsible for quite a considerable amount of damage to the external parts of the plants.

Practical control of this pest has been found difficult. Since our native *Dendrobium speciosum* is so common in Queensland, both in more neglected gardens and in our scrubs, there is a continual source of re-infestation.

Where possible it always helps to collect and destroy any of the bettles or grubs that can be caught, by burning, squashing, or immersion in kerosene. The numbers in the glasshouse can be reduced in this way, and then further entry prevented by the use of gauze. This, of course, also prevents egg-laying and subsequent larval injury to some extent. If a plant shows evidence of internal attack, damaged portions that can be removed without killing the plant should be cut off and burned.

When the foliage of an Orchid has become matured and relatively resistant, spraying or dusting with a stomach poison such as arsenate of lead would prevent any surface injury, but would not check internal attack by the larvæ which have already entered the stem. The use of a spray for repelling the beetles has also been suggested. This consists of an emulsion of white spraying oil in water at the rate of 1 to 50, together with a few drops of nicotine sulphate. The nicotine sulphate should be handled with care because of its poisonous nature.

Scolytid Beetle. Another beetle which can wreak havoc among the Orchids in Brisbane and elsewhere, is a small borer of the family *Scolytidae.* It has probably been introduced from overseas. The adult is a tiny cylindrical brown beetle, sharply cut off at the tail. It is about 1/16th of an inch long, and being so small it would not be confused with *Stethopachys.* The beetle burrows its way into the stems of Orchids and tunnels round for a time before laying its eggs. It then comes back along the tunnel and often dies a short distance inside the entrance hole.

A peculiarity in diet is exhibited by these beetles and their larvæ. They belong to a group known as the "ambrosia" beetles. While the beetles do irreparable injury in their boring activities, they do not actually eat the plant material but feed on a mould which grows on the tunnel walls. A tiny, curved, legless grub, cream in colour, hatches from the egg laid in the tunnel, and feeds on the fungus. After a series of moults it eventually develops into a pupa, which is also cream in colour and about equal in size to the final larval state. The skin of the newly formed adult which develops from the pupa is not hard enough to allow it to immediately begin burrowing, so it stays in the pupal shell for one or two weeks before leaving the tunnel. When it does emerge it selects a new stem, and boring in to make a tunnel of its own, the life cycle begins again.

Killing off by hand any beetle that can be seen may be found sufficient to control this pest, but more drastic measures, i.e., burning infested portions of plants, or even complete plants, would probably be found more effective in protecting the remainder of the collection, and checking the attack on other Orchid houses.

Cockroaches. The house cockroach is always with us. Most of you know how the eggs are laid in batches and covered with a brown case resembling a purse. The case is carried around by the adult female for a while, and then placed in a secluded corner to hatch. The young ones are wingless when they emerge, and remain so throughout about six growth stages, when they become winged adults.

The cockroach which commonly infests rotting wood and peat is even more harmful, because it breeds in close proximity to the plant. Unlike the house cockroach, this one has no winged stage. Quite often it is introduced to the Orchid collection through the medium of compost material gathered in the scrub.

The strong mandibles possessed by these pests and their allies, the grasshoppers, enable them to feed by chewing root tips and growing points.

The house cockroach may be kept in check in the glasshouse by keeping it as clean as possible, and also reasonably insect-proof. If necessary, cockroach powders or baits could be tried.

When the compost infesting species manages to establish itself in an earthenware pot, a crystal of the fumigant paradichloro-benzene could be placed inside the drainage hole until the plant is repotted. This may also be effective in some degree in getting rid of the wood lice.

Grasshoppers have a life history much the same as the cockroaches, except that the eggs are laid in the ground one or two inches below the surface. Both the immature and winged stages of grasshoppers concentrate on plant tissues as food. Although a lead arsenate spray will provide sufficient poison to kill these pests, it is rarely necessary since they can usually be kept under control by hand picking and destroying.

Caterpillars. In the same way caterpillars, which constitute the larval stages of moths or butterflies, may occasionally be found chewing the leaves or flowers of an Orchid plant. It is not worth while spraying where only a few are concerned, and they may easily be destroyed by hand.

Slugs and Snails, of which Orchid growers need very little description, are of two types, and probably more than two species are active. One type has the common snail shell, while the other carries a soft or cartilaginous "shell." These creatures have a fairly broad rasping tongue, and they make full use of it on the tender growth of Orchid plants.

For those who do not like the use of poison baits, fresh lettuce or cabbage leaves placed around in the bushhouse or glasshouse in the evening are often found to attract slugs and snails, which are found sheltering under them in the morning when they can be destroyed. Others prefer to dip the leaves in a lead arsenate solution. Another bait now widely used has metaldehyde as its poisonous and attracting constituent. This is purchased in tablets as "Meta"—which incidentally is inflammable—one tablet being powdered and mixed with 8 ounces of bran. The mixture is moistened until it is of the consistency of a loose meal, which is either broadcast among the pots or placed in small heaps about a foot apart. If this is done in the open, some provision should be made for protecting the heaps of bait from the rain. Recently a ready mixed metaldehyde bait has appeared on the market. Other baits have been suggested, one consisting of a teaspoonful of calcium arsenate, a handful of bran, and enough molasses to form small lumps.

To protect budding pseudo-bulbs or potted plants hanging by wires, dry cotton-wool placed around the base of the bulbs or around the wires has been found effective, since the pests do not appear to attempt to cross this material.

Woodlice or *slaters* are crustaceans, and as such are allied to prawns and lobsters. They often occur in large numbers amongst Orchid roots, and cause some trouble by chewing off root tips, or the tips of new bulbs. They vary from ¼ to ½ an inch in length when fully grown, are oval in outline, slate grey in colour, and the body is divided into quite a number of segments with a pair of legs on the majority of them.

Various control measures have been suggested. The woodlice may be floated out by immersing the pot in a tub of water. The metaldehyde bran bait mentioned earlier in connection with slugs and snails is also worthy of trial, and would thus probably serve a dual purpose. When repotting plants an attempt should always be made to have the fresh compost as free as possible from these and other pests.

(*To be continued.*)

● *Cypripedium niveum, var alba.*—This little known, and perhaps lesser grown dainty white species comes from an island off the coast of Penang. It appears to be free flowering and sturdy. I purchased about 100 plants last year which are doing well here. The flower is almost pure white with the exception of two pale yellow spots in the centre. Some plants that I have flowered show quite a lot of purple dots on the petals, but the one illustrated is a really fine sample of a white species. The width of the bloom is 2½ inches, the stem being 7 inches in length. "It blooms during summer, and sometimes produces two flowers on a spike. Every one who sees it is charmed with it, as it is very free blooming" (Williams). "The preference shown for limestone is manifested even under cultivation, for it unquestionably thrives better on a substratum of drainage composed of nodules of limestone than of broken crocks" (Veitch).

—T. C. Harveyson, Brisbane, 10/3/40.

● Elsewhere in this issue an article is published from the pen of Mr. F. Th. J. Nyland on semiterete *Vanda* hybrids. His assistance in enabling us to understand more readily these subjects is appreciated. We regret, however, that temporarily—earnestly hoped—there is a dislocation in the currency dealings between Java and Australia, which prevents us, for the present, from indulging in these handsome Orchids. Time alone will right matters when we hope that international Orchid lovers will again enjoy the privileges of intercommunication. The currency restrictions apply to all non-sterling countries.

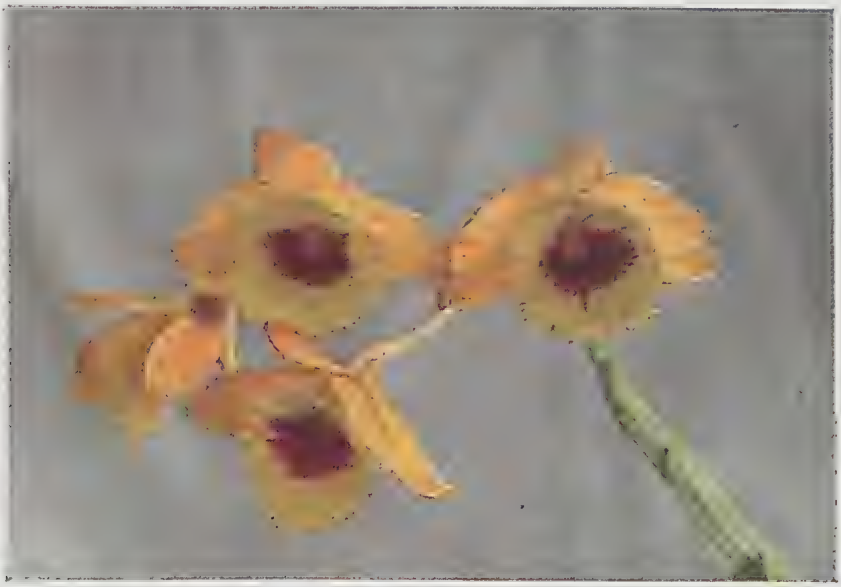
G. Ghose & Co., of Darjeeling, India, have forwarded their current catalogue, which contains a number of Himalayan specialities suitable for cultivation in Australia, notably Cymbidiums, Cypripediums, and Dendrobiums.

Mr. E. L. Hayes of Campsie uses a 2 per cent. solution of mercurochrome as a fungicide, and for treating bacterial troubles in Orchids, painting it on with a feather or small camel hair brush.

Outstanding Subscriptions for The Australian Orchid Review, 1938-39 and all payments for Subscriptions from now on should be made to: "The Australian Orchid Review," Box 2582E, G.P.O., Sydney.

● On January 26, 1940, a meeting was held in Cairns, North Queensland, for the purpose of forming an Orchid Club, an attendance of fifteen forming the foundation, while sixteen other prospective members are in view. The gathering decided to be known as the North Queensland Orchid and Bushhouse Society. Monthly meetings will be presided over by Mr. A. Wilkie, as President, Mr. B. Croft is the Hon. Secretary and Treasurer, both being supported by five enthusiastic committeemen. We understand there is expert talent in the society, able and willing to deliver lectures on various phases of Orchid and general bushhouse management. Here's success.

● *Outstanding Subscriptions.*—There are a number of members who have failed to pay their subscriptions for a very considerable period. Your Committee must carry a certain amount of responsibility for having neglected to send accounts as they became due, but that does not altogether exonerate those in arrears. In view of a considerably reduced revenue on account of the curtailment of advertising, an appeal is made to members to bring their subscriptions to date. A reminder was sent to a number of members whose subscriptions are overdue, but the response so far is disappointing.—Hon. Secretary's monthly report for February.



DENDROBIUM FIMBRIATUM, *Hook, var.* OCULATUM

Sepals and petals cadmium orange; labellum saffron yellow; "eye" in labellum dark reddish-brown to maroon. Distribution Himalayas to Upper Burma, in tropical valleys up to 4500ft.; blooms from September to November (usually October); requires glass house treatment while growing, and a rest in the bushhouse during the winter, to get the best results.

Grown and photographed by P. A. Gilbert. Hand coloured by N. Humphreys.

● Many *Dendrobiums* are now showing their flower buds, and will need careful attention regarding the application of water, and the sustaining of a slightly higher temperature. All plants with shrivelled bulbs will require a gradual plumping up, so that there will be an ample supply of material to nourish the developing buds. This process must be carried out slowly, as any undue or sudden excitement may transform the buds into vegetative growths.

● For success in producing a large number of *Dendrobium* blooms much will depend on the good judgment of the cultivator. If the compost be kept too dry, a check is given to the whole plant, and should this occur during the development of the flowers, their size will be considerably reduced. Too low a temperature when the plant is in an active state either of growth or producing flowers, will also mean a check varying in intensity as the deficiency of warmth increases.

Cool House Culture and Notes for Amateurs

T. H. JAMES, *Longueville, N.S.W.*

● By the time these notes appear another winter will be well on the way, and, as our Orchids generally require considerably less attention during that season than others, the opportunity should be taken to make any alterations or renovations that may be necessary or contemplated.

Those with unheated glass glass houses should let down their blinds at night to minimize the radiation of the heat stored up during the day. But keep them up during the day time, in fact clear glass would be beneficial.

Until the advent of spring, watering will require careful attention. In the bush house *Dendrobiums* and other epiphytic Orchids will need very little water, just sufficient to keep the bulbs from shrivelling. It is difficult to advise on this matter, but, generally, if the weather be dry, a light watering once a week should be ample, but if cold and dull do not give any water. Wherever possible give some protection from continuous rain during the cold months, and remove all moss. Watering that is necessary should be done in the morning and on sunny days.

DENDROBIUM NOBILE

This fine form is superior to many of the more costly hybrids. Flower 3 inches across. A jungle plant from Sikkim, grown and flowered at Manly, N.S.W.

Grown and photographed by H. J. R. Overall.

As with the bush house, the principal problem in the unheated glass house during the winter is watering and perhaps the best suggestion I can make is a careful study of the excellent article on watering which appeared in the September 1939 issue of this *Review.* During this period terrestrial Orchids should be kept generally just moist. An occasional slight dryness would not cause harm, in fact, would be beneficial.

Because the season happens to be winter do not completely close up the house. Ventilation is necessary even at night, and if no air be allowed to circulate during the cold nights moisture would be apt to condense on the foliage and also flowers, if there be any, and cause spotting.

Crowded Houses. — I have frequent discussions with a very respected friend of mine who is a keen and successful grower of Orchids, on the question of overcrowding. He opposes crowded houses, claiming that Orchids need space for proper development. Sometimes I am inclined to agree with him. I have, however, seen a number of houses lately, both heated and unheated, which are not only crowded but packed to the absolute limit with plants which do not appear to resent the congestion but to relish it, for the growth is luxuriant. In one house, that of Mr. E. W. Usher, of Vaucluse, *Vandas, Cattleyas, Dendrobiums, Cypripediums* and others were growing well and flowering profusely side by side in a small house, in which I doubt whether another plant could be placed. In fact, as the plants grow larger many will have to find another home. Much of the original paint had been washed off the roof, and there are no blinds. The day I called was hot, or, I should say, very hot, and it was hotter still in the glass house, but the humidity was very high which was obviously the saving factor. The majority of his plants were flourishing in the conditions, including a large number of *Cypripediums* which are supposed to require a certain amount of shade. As far as I could see, every plant, particularly *Cattleyas*, which had reached the flowering stage, had either flowered or was in sheath. His *Cymbidiums* were out in full sunshine and the foliage was not burnt or even yellow. Many of them were in spike.

LYCASTE SKINNERI

A nice variety.

Grown by Mr. T. H. James. Photo by H. J. R. Overall.

In another house, or rather houses, that I saw at the home of Mr. Ford of Blacktown, *Dendrobiums nobile, Wardianum* and others presented a tangled mass, many of the growths being about four feet in length. The humidity of the house was close to saturation, yet the plants showed not the slightest sign of spotting or other disease. The houses resembled the jungle, and in spite of the overcrowding the plants were not soft, due, no doubt, to the combination of light, air, and humidity. Mr. Ford assured me his plants flowered profusely.

I think most of our houses are crowded—I know mine is—not due to deliberate action, but to the continual acquisition of new plants, and the natural increase in size. Our President's houses are crowded not not only with Orchids but with numerous foliage plants which make them a delight, and I know of no general collection of Orchids which are growing better. From what I have seen I am inclined to think that, apart from the point of general appearance, Orchids seem to appreciate the proximity of other plant life. I certainly believe that the presence of foliage plants is, if not altogether necessary, of great assistance to successful Orchid culture.

Dendrobium Falconeri.—I noticed in the house of Mr. G. Cruickshank at Randwick a plant of this *Dendrobium* growing particularly well. This is the first occasion on which I have seen it looking happy. Possibly there are others who are succeeding with it, but they have not come under my notice. This particular plant is in one of those half-pots, i.e. flat on one side. It is hung on the wall of the house on the shady side and about three feet from the ground where the conditions are somewhat shady, cool and moist. This Orchid is probably one of the most beautiful of the *Dendrobiums* rivalling even *D. Wardianum.*

Odontoglossum grande.—This Orchid is one that should be in every collection, both bush house and cool glass house. It is more easy to grow in our climate than the hybrids or other species. It is a native of Mexico, and in summer requires plenty of water and sunlight, but avoid very hot spots. A very fine specimen was exhibited at a recent meeting of the N.S.W. Society by Dr. A. C. Burstal, of Killara. It is in a small pot placed inside a larger one, the space being filled with tan bark. This method was not deliberately adopted but roots were noticed coming from the bottom of the original pot, and it was placed inside the larger one to avoid repotting. In its native habitat it is accustomed to a definite resting period but Dr. Burstal advised that his plant is never allowed to become dry.

Lycastes.—It has been claimed by many that these require artificial heat during the winter. This is like the claim made for *Cattleyas* and other genera. *Lycastes* do quite well with me. One of my plants with two main leads has three flower spikes coming from each. I expect to do much better next year as last year's bulbs, from which the present bulbs came, matured, to only one inch in length owing to having been allowed to get very dry during my absence in the summer. This Orchid requires plenty of water and the compost therefore needs to be fairly open with good drainage. Growing sphagnum moss on top of the compost is very beneficial. The only time a slight dryness is permissible is after the leaves have finished growing until the flower spikes appear, which is during the autumn or winter. There are many species but perhaps *Skinneri,* with its almost endless varieties, is the best and hardiest. *Lycastes* will also grow in the bush house if given protection from the south and west.

Ceologyne cristata.—This Orchid, which is so easy to cultivate, should be grown far more than it is. It gives the best results grown in a shallow pan and in a position in the open where it gets the full morning sun. The variety with the short rhizome is much better than that with the long rhizome. With me it is doing well in a compost somewhat similar to that used for *Cymbidiums,* but much more open, such as a mixture of fibre, peat moss, old cow manure and finely broken charcoal or crocks. It dislikes disturbance of any kind, and, if it is necessary to repot, do not interfere with the roots but place the whole clump in a larger pan. Even that will interfere with the flowering the following year. It requires plenty of light to flower properly. My own plant, which will probably have over 50 spikes of flowers this year, was partially shaded on one side by some *Thunias* and there are no flower spikes on that side. One of the difficulties met with is the ultimate congestion of bulbs. The best way to overcome this is to cut out with a sharp pointed knife any old bulbs which may interfere with the development of the new bulbs. They get so crowded that many flower spikes will be unable to emerge or receive injury in doing so. I have had to cut away about 40 old bulbs from my plant this year. The long rhizome type is somewhat of a problem unless grown around a tree fern butt or similar method. They should not be allowed to become dry; if the bulbs shrivel they will take long to recover.

Oncidiums such as *varicosum, flexuosum, sphacelatum* and *aurosum* grow very well with me in the cool glass house. Some I have in pots, others on slabs of hard Java fibre. A plant of *Oncidium flexuosum* was given to me about three years ago. It had three small bulbs and was on a slab of fibre. By continuous division this plant has now 12 leads and is constantly in flower. The roots of these *Oncidiums* should never be allowed to get dry as the ends will die off. The plant of O. *flexuosum* mentioned has been trained to grow in circles by altering the point of suspension of the block as the bulbs reach the sides or ends. Last year some of the roots from the latest bulbs grew into the air instead of into the fibre. Those roots, after extending about two inches, all died and the bulbs were smaller than those they came from. I fastened another piece of fibre on to the original block and the new roots are penetrating it. The new bulbs promise to be much larger.

Phaius.—Most species of this Orchid can be grown in the bush house. In fact, with me they do better outside in a warm spot protected from the west and south and with the barest protection of ti-tree overhead and they flower well. They prefer a rich light compost with an abundance of water during the summer and a slight dryness during the winter. An English journal which came under my notice advocated repotting every year as it was claimed that the copious watering tended to sour the compost. Up to the present I have found that unnecessary. A simple method of replenishing a portion of the compost without disturbing the roots is to lay the pot on its side, and wash out some of the soil with the hose at high pressure. Fresh soil can be filtered in between the roots. The same plan could be adopted with *Cymbidiums.*

Cymbidiums.—All that are going to flower this year will now be well in spike. Some will be in flower and some will have finished flowering. I have heard it remarked by many that this year should be exceptional for flowers on account of the long hot and dry summer. Those in spike should receive a moderate amount of water and a regular supply of weak liquid manure until the flowers are just about to open. Any repotting that may be necessary should be completed as soon as possible after July to give the new bulbs an opportunity of maturing early in the new year. In the early spring give your plants all the warmth and light possible to encourage early movement. Plants which make a late start into new growth are apt to miss in flowering.

Cypripediums.—By the time the September number of this Review is published, most of the Cypripediums will have finished their flowering and that is the generally accepted time to repot. In the meantime be sparing with the water. Keep them just moist. If a plant in flower be on the weak side cut the flowers early. When repotting consideration should be given to the growing conditions. The generally accepted composts are fibre and a little moss for the mottled varieties and fibre, moss and a little leaf mould for the green leaved varieties. Some also add a few pieces of very old cow manure. I have found, however, that many different composts are used, including tan bark, with a varying measure of success. If grown in a bush house or in the open the moisture holding substances should be reduced in order to avoid a wet condition during the cold winter months. In summer the compost could be topped with peat moss to minimize evaporation. Water passing through the peat moss also seems to extract some element which is of great benefit to the plants. It could be removed during the winter. In fact a renewal of the peat moss several times during the warmer seasons would be an advantage. After repotting be very sparing with the water for several weeks. Those just beginning the growing of this genus would probably obtain more satisfactory results by confining themselves for some time to the green leaved species such as *insigne, Spicerianum, villosum, hirsutissimum* and *Charlesworthii.*

I have just received a letter from a grower at Vaucluse, Mr. H. B. May, who has his *Cypripediums* planted in rockeries out of doors but partly protected from the sun by trees. His flowers of *C. villosum* this year are seven inches across, and all types are growing and flowering well.

Thunias.—New growths will appear at the base of the old canes sometime in August. When these new shoots are about one inch high repot into a light rich compost of leaf mould, peat moss and old cow manure. A stake will be necessary to which to tie the old canes as all the old roots will be dead and should be cut away. Until the new growths are about three inches high water sparingly and from then on water copiously. They do best outside in a sunny, sheltered position until the flowers appear when they should receive shelter to protect the flowers. A single cane about three quarters of an inch in diameter would require a six inch pot. My own canes mature frequently to 1½ inches in diameter and I place three new growths in an 8 inch pot. Canes will frequently produce two, and sometimes three new ones.

Dendrobiums generally should receive less water now and plenty of air. *D. Wardianum* particularly should be kept on the dry side. Many, such as *nobile* and *Wardianum* will have started growing before September even if the flowering has not finished. Do not be tempted to be too free with the water, however, until new roots appear. Those who are prepared to take the trouble would greatly benefit their plants by placing them on bright sunny days right out in the full sunshine. This would harden the bulbs and induce better flowering and also better bulbs for the following year. About June flower buds will appear and light watering from then on will be necessary.

Information Required

C. P. DIGNAM, *Greenwich, N.S.W.*

● Although always an enthusiastic gardener, I had no interest in Orchids until about five years ago. I had read Mr. Cooper's remarks as reported in the newspapers, and had made a mental note to be on the lookout for a *Cymbidium*, whatever that might be. There the matter might have rested had it not been for my coming upon the curious, long, pseudo-bulbs of *Dendrobium Pierardii*. It was by these that I was drawn into the cult of Orchid growing. A friend hailed me one day at the Sydney Municipal Markets, and holding aloft what seemed to be a large piece of dried seaweed, urged me to take it home and grow it. It appeared from his story that these knobby strings would, under proper care, shortly break into bloom like the staff of Parzival, or the walking stick of Mr. Fotheringay in H. G. Wells' story, "The Man Who Could Work Miracles." Well, he was persuasive, curiosity was aroused, and I went home with a curious parcel, the first of many. Apart from a few native Orchids, I had never seen a *Dendrobium* in bloom, and when those pseudo-bulbs, running true to form, were transformed into long strings of strange and beautiful flowers, my "goose was cooked." The kind of people who read this Review will understand the sort of thing that happened to me.

DENDROBIUM UNDULATUM, *R.Br.*
var. Broomfieldii, Fitzg.
A yellow form of the species; the pseudobulbs also being more angular; sepals and petals up to 1 inch or more long. The species blooms from September to November; distribution North Queensland and adjacent islands.
Grown by S. E. Golik. Photographed by J. R. Bailey.

That was in 1936. Since then I have acquired a lot of plants, and have spent a fair amount of time on their culture. On the whole I feel grateful to my friend, but I must admit that there are times when I wish that, when he waved that thing at me, I had hit him firmly behind the ear with a five-inch flower pot, or perhaps used the *D. Pierardii* after the manner of a bowstring.

Having served an apprenticeship of five years at the business of growing Orchids I have long ago lost that first, fine, self-confidence which is bred by early successes. Like most growers, I read with a very wry smile Mr. Hermon Slade's recent article, "Ten Years After" (A.O.R., Vol. 4, No. 2, page 41). I should like to see every grower compelled to write just such an article every five or six years.

It would be most instructive, and we should all learn a good deal in that way.

I think most readers will agree with the following two propositions:—

(1) Different growers may get a similar result from different treatment. For example, Mr. X grows his *Lycaste Skinnerii* out of doors and under some trees, somewhat after the manner of *Cymbidiums* but with a little less sun. His results are entirely satisfactory. Now it seems that Mr. Plowman grows his plants under glass, and those who saw his exhibit at the last annual show will know that his results are also very satisfactory indeed. A grows *Dendrobium nobile* under glass, and B in the bushhouse, with identical results.

(2) Different growers may get different results from similar treatment. For example, Mr. Plowman (in A.O.R., Vol. 2, No. 2, p. 20) writes that *Zygopetalum Mackayi* is easily grown and flowered if treated in a certain manner. I find this plant most difficult to flower, and although treated according to his ideas, I am afraid that its latest production will turn out to be a growth and not a flower bud. A grows *Cypripediums* in tanbark and induces B to follow suit. B tried it and fails. C may try it and succeed.

What is wanted is more and more information. If we can read the experiences of others we can vary our own methods, and by cautious experiment with each particular kind, eventually hit upon the treatment most suitable in our particular environment. The only place where we are ever likely to find all this information is in this Review, and this article is a plea for the use of the Review mainly for the purpose of setting out such growing information. Other articles, not primarily concerned with growing, must, of course, find a place, since there are presumably some readers to whom they appeal, but most of us, I think, are more interested in how to grow successfully, and prefer what we read in these pages to help us to that end.

Until some months ago Mr. T. H. James used to write a regular article which he called "Cool House Culture and Notes for Amateurs." To my mind this was the most interesting and practical item in each issue, but they have now stopped, and Mr. James informs me that this is because he feels very strongly that they have had the effect of giving an impression that he writes as an authority. It is, of course, quite plain from his articles that he never makes any such claim, and indeed from time to time disavows any such intention. One can only speak from one's own experience, and I for one found the articles most helpful, and hope most sincerely that some means may be found to reassure him that nobody is likely to confuse the relation of Mr. James's experiences, and his reasoning therefrom with a desire on his part to pontificate. Not only should I like these articles to recommence, but I should like a similar series by a warm house grower, and a whole host of special articles giving the experiences of any growers who find that they are having success with any particular Orchids. Should there be differences of opinion, it is all the better, since my plants, which formerly languished under the treatment recommended by A, may recover and thrive under that recommended by B. It is advisable that the treatment should be described in detail and at length. The size of the pot compared with the plant, compost, growing situation at different seasons, and time of flowering should all be given. I have seen plants described in an article as "growing out of doors" which, in my opinion, were growing under bush house conditions. If such phrases are used, let us know what they mean in regard to sunlight and wind.

Finally, speaking for myself, I should like more information as to the following *Dendrobiums*: *Falconeri*, *chrysanthum*, *aureum*, *dixanthum*, and *Findlayanum*. It would be nice to know why my *D. lituiflorum* makes such fine, long pseudo-bulbs each year ,and then drops all the buds when they are half developed. There is *Vanda coerulea*, which seems to be badly grown by most of us, and I should like to try my hand at some *Phalaenopses* if the road to success was indicated. Is there a reader flowering *Stanhopeas* with conspicuous success? If so, let him take his pen and write quickly. In short, why not give to each class of Orchid the attention which has already been given in these pages to *Cymbidiums*. Certainly *Cymbidiums* are easily grown, and most of us have success with them, but that may be because of all that we have read on the subject. If we can get as much information about other Orchids, the whole standard of growing should be improved.

● The Chandra Nursery's price list of 27 pages of Orchids has been received. Seventy-odd species of *Dendrobiums* alone, suitable for horticultural purposes, are listed, at prices within the reach of all. Chandra's full address is in this issue.

Some Notes on the Mounting of the Genus Sarcochilus

J. SHAW, *Burleigh Heads, Q.*

● There is quite a number of Orchid growers who affect to despise, to a large extent, our native species. Of our five principal species of *Sarcochilus*, two at least are well worth growing for their flowers alone; I refer to S. *Hartmannii* and S. *Fitzgeraldii*. When properly handled they make a fine show, and are eagerly sought after for evening sprays by the ladies. While I do not for a moment propose to set up as an authority on the growing of this genus, I have seen the species growing in their natural habitats and have endeavoured to give them as near as possible their natural conditions in my bush-house, with what I consider satisfactory results. I think this genus presents more difficulties in the matter of attractive mounting than any other. In offering the following suggestions it is in the earnest hope that they will enable other growers to successfully handle these floral gems.

CYPRIPEDIUM NIVEUM, *Rchb. f.*
var. alba
Grown by J. Shaw. Photographed by C. Hart.

S. *Hartmannii.* I am taking this hardy chap first, as it grows on barren cliff faces, and often on bare rock exposed to all the elements, at an elevation of from 2,000 ft. up. It likes all the sun there is, and will stand long periods of drought; in fact, the only thing in my opinion that will kill it is too much water. I have mounted *Hartmannii* in flat-bottomed wire baskets, lined with peat and filled with light (very light) sandy loam. Treated as a terrestrial, it flowers very prolifically every year. It is hung just under a light batten roof, where it gets the rays of our South Queensland sun all day.

S. *Fitzgeraldii* is considered by many to be closely related to *Hartmannii*, but it requires entirely different conditions. It is an *Orchid* that I consider easy to grow and hard to flower, or hard to grow and easy to flower. No *Orchid* to my knowledge, requires a finer adjustment of the right light to ensure success. I have seen it growing luxuriantly in dark, damp, gloomy places at the bottom of deep gorges where the sun never penetrates, but have never seen it flower there. On the other side of the gorge where the sun strikes, the plants, not half so robust, bloom quite well. The thing is to strike the happy medium. This species I have mounted in large terra-cotta Orchid pans 5½ inches deep and 12 inches across, with 5 large 1½-inch holes in the bottom. These pans were filled nearly to the top with large pieces of soft sandstone fitted in like the pieces of a jig-saw puzzle, the roots were then carefully poked with a fine stick into the cracks of the sandstone, then a small quantity of sandy loam was dusted in, and a topping of growing sphagnum moss was worked around the base of the plants. It makes quite a fine show when thickly planted. My plants are growing on a ledge overhanging a fishpond shaded by the fronds of a large overhanging basket of drooping fern, and also the batten roof.

As a diversion I should mention that I have accorded exactly the same treatment to newly imported plants of *Coelogyne cristata*, an Orchid hard to establish.

The resultant growth is something one dreams about, but rarely gets; they are growing side by side. *Fitzgeraldii* must always be kept damp *at least*.

S. *falcatus*, the Orange Blossom Orchid, grows on the Sally-wattle (Acacia sp.), and is found high up also, but will grow much lower down than *Hartmannii*. Ninety-nine per cent. of the plants face the east or north-east, and are only shaded by sparse foliage, the roots stretch out in all directions on the trunk, but it is a slow grower. Wherever it is found it is draped with a wiry kind of moss, and this appears to me to be necessary for its cultivation. This moss is very similar to that which comes packed around the roots of imported Indian *Dendrobiums*. My suggestion for mounting *falcatus* is to make a large raft—say a foot square— built of $\frac{3}{4}$-inch square hardwood, rough sawn, and the more weathered the better. Space the bars $\frac{3}{4}$ of an inch apart, put a screw eye in one corner for hanging, arrange your plants in the gaps, wedging them in with rolls of peat and the outer leaves of a dead elkhorn that you can roll into a cigar, drape heavily with the moss that you have gathered with them, and let the roots go through the back, tucking them in again where ever you can. Hang them facing the east, shade lightly.

S. *divitiflorus*. Mr. Murray Cox, in his very fine "Cultural Table of Orchidaceous Plants," was kind enough to refer to my article in this Review, March, 1939, entitled "Blister Culture." He said he thought the blisters would be very suitable for the mounting of *Sarcochilus*. Strange to relate, I have tried them least of all in blisters, except *divitiflorus*, which grows quite well packed in peat in a blister with the principal roots exposed to crawl over the outer side. The long, orange-coloured sprays would be much more valuable were they longer lasting. I have since mounted S. *Hillii* and S. *Weinthalii* similarly in small blisters.

S. *Ceciliae*, the Fairy Bells Orchid, is another rock lover, and grows well on grottos, around fish ponds, along the edges of concrete benches; being merely stuck there with a handful of damp soil, it will soon do the rest. Its prolifically produced racemes of pink, bell-shaped flowers are very effective and ornamental.

Sarcochilus will stand a far larger range of temperatures than any grower is likely to give them, right light and correct watering are all they require.

● I am sending a photograph of *Cypripedium niveum*, var *alba,,* showing two flowers on the scape, for publication in the Review. There is a good deal of interest in the species here. Plants were imported last November, and I flowered it in February, it is still in bloom. It is perfectly white excepting the base of the petals and dorsal sepal, which are faintly dusted with brown specks. My plants were imported through the Queensland Orchid Society.

—J. Shaw, Burleigh Heads, Q., 17/3/40.

● At the January meeting the Hon. Secretary referred to the article on *Cymbidiums* which appeared in the September issue of *The Review*, advising members to watch their plants, and if the new bulbs had started to swell at the base, to gradually ease off the water, but not to allow the plants to become too dry. If much rain should develop, turn the pots on their sides.

● *Australian Orchid Review*: The reputation of this publication is undiminished, and the quarterly issues are keenly anticipated by subscribers. In our last Annual Report we referred to the increasing difficulty in obtaining suitable subject matter for publication. Unfortunately, this problem still faces the Editor of the Review, with the result that it has been impossible to maintain publication without some delay. The position is deplorable, because it would be a tragedy and distinct loss if our *Orchid Review* was obliged to suspend publication through lack of contributed articles. We therefore again appeal to members to offer the Editor some co-operation by the submission of photographs or articles of general interest to Orchid growers, with the object of maintaining our *Australian Orchid Review* at the highly commendable standard it has attained.—Extract from the Queensland Orchid Society's Annual Report.

● At the March (28/3/1940) meeting of the O.S. of N.S.W., Dr. A. C. Burstal displayed a magnificent plant of *Odontoglossum grande* carrying two spikes with three flowers on each. The compost was todea fibre and tan bark. It has been kept moist for the past five years.

The Australian Orchid Review publishes all matter appertaining to Orchids, botanical or horticultural. It is a journal of Orchidology, and not merely a medium for instruction in the cultivation of Orchids.

The Orchids of National Park, N.S.W.

PART II.

E. NUBLING, *Normanhurst, N.S.W.*

Part 1 appeared in Volume 4, No. 4, containing Introductory remarks, a list of Orchids recorded by Mr. and Mrs. E. Nubling, and details of epiphytes.

● Having dealt with the epiphytic orchids in part I, I shall now turn to the terrestrials; no descriptions of flowers are, however, intended.

Dipodium punctatum, R. Br., popularly known as the "Spotted Lily," is found on the uplands as well as on the slopes and in the valleys. Its principal flowering time is from October well into January, though we have found them as late as early March and even at the end of April. Botanically this species is of interest through its symbiotic relations with a fungus which provides it with most or all of its nutriment.

Galeola cassythoides, Reichb. f., like the foregoing, leafless, is usually not easily detected when trailing along the ground among fallen leaves, stones, etc., maybe for several yards, until it reaches a tree, f.i. *Angophora lanceolata*; it then begins to climb up on the trunk to which it affixes itself readily with short flat sucker-like roots, reaching 10 feet in height. Flowering September to November.

Gastrodia sesamoides, R. Br., the "Potato Orchid," with a saprophytic habit, is found along creeks, often on or near the top of waterfalls, and other wet places. In one year quite a large colony was noted on lower Temptation Creek, but in the following year there was no trace of it. Flowering in November and December.

Spiranthes australis, Lindl. Usually in wet or swampy ground and soakages, along creeks and small rivulets. Flowering time somewhat irregular in different seasons, usually January to March; but noted also at the end of May and even in August.

(According to Prof. O. Ames this should be S. *sinensis* (Pers) Ames).

Calochilus Robertsonii, Benth.; C. campestris, R. Br.; C. paludosus, R. Br. Found on the uplands and elsewhere, generally in poor, sandy soil. Flowering from September to November.

Thelymitra ixioides, Swz., "Sun Orchid." This handsome species occurs in many situations, but prefers sandy soil; on the uplands, hill slopes and ledges, also open forest; sometimes in extensive stretches. Often in association with *Caladenias* and *Glossodias*. Flowers from August to October, but has on occasion been noted doing so in the early part of July.

T. media, R. Br. Found in perfect agreement with Fitzgerald's description in his "Australian Orchids," repeatedly in different years near Loftus, and also on drainage ridges on the uplands for Bola Creek o.a., that is in stiff swampy soil in sandstone country. Flowers in October.

T. nuda, R. Br. "Nuda" refers to the crestless, bare top of the column. Only found in two or three places. Flowering in September.

T. longifolia, Forst. Usually self-fertilized. Rather widely distributed on swampy ground, soakages, wet rocks and cliffs. Flowering in September and October.

Mr. W. H. Nicholls recognises only *T. pauciflora* as a valid species in N.S.W., but not this species which it closely resembles (see H. M. R. Rupp, Proc. Linn. Soc., of N.S.W., Vol. lxii, Part 1-2, 1937).

T. pauciflora, R. Br. On the uplands. Flowers in October and September.

T. carnea, R. Br. The small pinkish flowers are only rarely—on still, sunny days—fully opened. Self-fertilization takes place, probably always, already in the bud, and seems invariably effective, every plant in a group of up to 30 specimens carrying a seed capsule. Associated frequently with *T. longifolia.* Often noted in numbers on wet rocky ledges, soakages, wet rocks. It flowers in September and October.

Thelymitra venosa, R. Br. This distinct species is supposed to occur in the Park; but we have never come across it; though suitable situations, as in the Blue Mountains, would not be lacking.

Diuris maculata, Sm.; D. aurea, Sm.;
D. sulphurea, R. Br.

D. maculata is the first to flower, from end of June to September; in some localities it is, on the same ground regularly followed by *D. aurea,* usually flowering in September and October. *D. sulphurea* flowers in October. Found on the uplands, in heath and open forest and grassland. The first two species can be seen in many places along the railway line from Sutherland to Waterfall in their flowering season.

Orthoceras strictum, R. Br., "Straight-horn." On the uplands in many places. Flowers from October to January. Self-fertilized in quite a peculiar manner.

Cryptostylis subulata, Reichb. f.; C. erecta, R. Br.; C. leptochila, F. v. M. These species show a preference for moist places and are generally found at the bottom of wet rocks and cliffs and elsewhere on moist ground; the last-named only in a few places. *C. subulata* flowers from December into February; *C. erecta* from November into March, and sometimes April; *C. leptochila* in November and December, also in April.

Microtis porrifolia, Spreng; M. parviflora, R. Br.; M. oblonga, Rogers. Found in many places in the Park, usually in damp and swampy ground, or soakages, etc. Flowering time September to December, and later.

Prasophyllum flavum, R. Br. Recorded only twice from near Loftus flowering respectively in December and November.

P. elatum, R. Br. This fine species is found on the uplands throughout the Park, on wet or swampy ground, sometimes in considerable numbers; flowering from August to October.

P. brevilabre, Hook. Recorded only from one place on Temptation Creek in two or three successive years; flowering in August and September.

P. odoratum, Rogers; P. patens, R. Br. On the uplands and hill slopes, usually flowering in September.

P. striatum, R. Br. Not as frequent as might be expected. Only occasionally found on the uplands, in wet ground, soakages, etc. Flowers from May to July.

P. Baueri, Goir; P. Deaneanum, Fitzg. Both species rather rare. Closely allied, differing chiefly in their petals. The former was found on Waterfall Creek flat on the roadside at a ditch; the latter not far away, both flowering in March. *P. Deaneanum* was also seen in flower, in May, at the edge of burnt *Leptospermum* scrub near Temptation Creek, in another year.

P. nigricans, R. Br. Rather variable. Occurring on the uplands in shallow peaty soil, under ti-trees bushes, and flowering from February to June.

P. viride, Fitzg. Uplands in sandy soil in various widely separated places. Presumably self-fertilized, since the flowers hardly open. Flowering March to June.

F. Woollsii, F. v. M. Found on flat ridge tops in sandy soil, flowering in March. In the same month, in 1933, a distinct natural hybrid, *P. fimbriatum.* x *P. Woollsii,* or vice versa, was noted on a ridge, striking off Florence Parade, among numbers of flowering plants of these two species.

P. fimbriatum, R. Br. Growing on the upland usually in moist ground, at the foot of soakage slopes, on top of wet cliffs, etc., sometimes on drier ground. Plentiful in some seasons; flowering from January to May. Not infrequently associated with:

P. Nublingii, Rogers. This species was first observed on the long sandy stretch of Waterfall Creek flat that lies between the gate cottage and the top of the falls, and where it used to be fairly frequent. Subsequently it was found in many places on the uplands as far as Loftus, and beyond, on rocky slopes, moist and drier ground in *Banksia* scrub, etc.; outside the Park area it was noted at Helensburgh, Como, Menai, etc. It shows a tendency to variation in the labellum, and Dr. Rogers recognized a peloriate form among specimens sent him. It flowers from about the end of January to June.

In the same tract of Waterfall Creek flat where the above species was discovered, the following species, determined by Dr. Rogers, were subsequently found by either of us:

P. bracteatum, sp. nov. In some respects resembling *P. Nublingii,* but differs much in others. Its outstanding feature is, in this genus and section, unusually long basal flower bract, which extends the ovary and a good deal even the tips of the lateral sepals.

P. Elmae, sp. nov. A quaint little plant of about 5 inches average height, with very small compact flowers, green at the base of the lateral sepals finely dotted with crimson lake. This was subsequently found during consecutive years in colonies, up to 50 specimens in one instance, in wet soil on the top edge of low cliffs near Florence Parade, and elsewhere. Outside the Park it was observed near Blakehurst, and in considerable numbers in a swampy patch near the Coast Hospital.

P. longisepalum (non. Fitzg.), sp. nov.

The next following was discovered in loamy sand at Loftus:

P. densiflorum, sp. nov., resembling Fitzgerald's *P. densum* from Mount Wilson. A real pygmy, usually from 2¼ to 3 inches high, though sometimes up to about 4½ inches, with a crowded head of dark purple red, small flowers. Subsequently it was found in other parts of the Park also, on the uplands, f.i. near Waterfall, the top track to Flat Rock Crossing, etc.

Corysanthes fimbriata, R. Br.; C. pruinosa, Cunn.; C. bicalcarate, R. Br. (Corybas aconitiflorus); "Helmet Orchids." They occur on the whole in similar situations, preferring moist, shady, and sheltered spots under ferns and among decaying leaves, near rocks and fallen tree trunks, on road banks, damp river flats, in gullies. Flowering from May into July, *bicalcarata* as early as April. In one year we found, on Little Bola Creek, in a limited space all three species flowering at the same time, and including:

C. unguiculata, R. Br., which we used to find regularly in successive years in a few places, near or under gumtrees and bushes, *Banksia* trees, *and Casuarines*, in small colonies. It flowers from May to July, associated in one place with:

Pterostylis pedoglossa, Fitzg., the only spot this latter was noted in the Park. Flowering in April to June.

P. concinna. R. Br. Does not appear to be frequent in the Park and flowers there in July.

P. curta, R. Br.; P. pedunculata, R. Br. These two species we always observed in association, often plentiful, in damp and shady places, particularly on river flats and near creeks. They flower from July to October.

P. nutans, R. Br., a common "Green-hood," occurs in similar situations, and is also often seen on rocks, all through the Park. Flowering from April to October.

P. acuminata, R. Br. On the uplands in many places, near creeks; frequented in *Banksia* and gum scrub, in the shelter of bushes. It flowers from March to July, and later.

P. grandiflora, R. Br. A fine species, found as a rule in moist places, river flats, creek gullies, etc., and flowering from April to September.

P. obtusa, R. Br. Recorded only from lower Bola Creek, near the main road; in flower in April to June.

P. parviflora, R. Br. Very variable in habit. In many situations throughout the Park. Flowering from March to June.

P. Daintreyana, F. v. M. Usually found in shallow, sandy or peaty soil, often on moist flat rocks on the uplands. It flowers from March to July, occasionally into August.

P. mutica, R. Br. Only one record; roadbank near National Park station. In flower in August.

P. longifolia, R. Br. All over the Park in suitable situations, preferring moist places. Flowering time from end of April right into October.

Caleana major, R. Br.; C. minor, R. Br. On the uplands, on ridges, terraces and ledges, in bare, sandy, rocky and sunny places. The former is found right through the Park, flowering from September to January; the latter is rather scarce and restricted in the Park to few localities only. It flowers from September to December.

Chiloglottis reflexa, (Lab.) Cheel; C. formicifera, Fitzg. In moist and shady places, on river flats, in creek gullies, near the bottom of hill slopes, etc. Both species may occur in the same locality, but flowering at different times, *C. reflexa* as early as January, but, as a rule, from March to July; *C. formicifera* from June to September. The latter is far less widely distributed than the former.

Acianthus exsertus, R. Br., A. fornicatus, R. Br.; A. caudatus, R. Br. The first two species are found distributed in the Park in numerous situations, on the uplands, slopes, gullies, etc. *A caudatus* occurs more in the higher situations, in shady places, or rocky slopes and ledges, in the river valley preferring the cooler, shadier, western hill sides; it flowers from June to October; *A. exsertus* from April to August; *A fornicatus* from May to August.

Acianthus (Cyrtostylis) reniformis, R. Br. Rather rare in the Park, and in our experience limited to a few places only. In damp and shady spots, usually at the base of rocks, among ferns, etc. Flowers July to September.

Eriochilus cucullatus, Reichb. f. On moist and rocky ground, soakages. Not frequent in the Park to our finding. Flowers March to May.

Lyperanthus nigricans, R. Br. Flowers freely only after bush fires. Found flowering in damp, sandy soil in August on Waterfall Creek flat. In the following year a few odd buds were observed, but never matured into flowers.

L. suaveolens, R. Br. Found on the uplands in many places. Usual flowering time August and September.

L. ellipticus, R. Br. Only known from the upper falls of Waterfall Creek, a small patch on wet rock, where it appeared to flower but rarely (October, 1927).

Caladenia alba, R. Br.; C. carnea, R. Br.; C. coerulea, R. Br. These three species occur in much the same situations, in open forest, heathland, gullies, etc., and may, on occasion, be found all together flowering in the same place, but *C. coerulea* is much less frequent, also in numbers, than the other, though exceptionally it may be observed in fairly large patches. *C. carnea* is by far the most abundant, flowering like *C. alba* from July to October, but the latter may often be seen already in May and June. *C. coerulea* flowers from July to September.

C. dimorpha, Fitzg. Simple flowering specimens were noted in two distinct places on

Waterfall Creek flat early in October, 1927. Search in this locality in subsequent years proved quite resultless.

C. tesselata, Fitzg. Found in damp, shady scrub, often under ti-tree bushes, near rivulets and creeks; regularly in successive years in several spots, near Temptation Creek; also near Gun Damain. Flowers from August to October.

C. testacea, R. Br. In open scrub and forest often at the side of tracks, on the uplands only. Flowering months: September, October.

Glossodia major, R. Br.; G. minor, R. Br. On the uplands and elsewhere, open forest, *Banksia* and tea-tree scrub, etc. Plentiful in certain seasons, *G. minor* often in extensive patches. Flowering from July to September and sometimes October.

G. major and G. minor, a hybrid between the two species, is, as Fitzgerald remarks, "thoroughly intermediate in character." It has been located in the Park regularly in consecutive years about Temptation Creek among patches containing both species. In one patch on one occasion no less than eighteen hybrids were counted. Cross-fertilization between the two species appears to be, therefore, a fact of long standing, having been observed by Fitzgerald sixty years ago. It may be mentioned here, too, that we have observed the same hybrid between Caringbah and Cronulla, at Como, Mortdale, Blakehurst, and near Chatswood.

There are several minor errors in Part 1: No. 13 of the list should be *C. tesselata;* No. 57 *P. Deaneanum;* No. 70 is given at *P. Iensoflorum* instead of *P. densiflorum.* On line 2 of p. 106 *Prasophyllum enstrate* should read *Prasophyllum australis;* on line 10, same p. *Lipsaris* should be *Liparis.* No. 22 *Corysanthes aconitiflores* is a synonym of *Corysanthes bicalcarata.*

● "Many hybrids of *Vanda Sanderiana* have been raised. Some of these are *V. Rothchildiana* (*V. Sanderiana* x *V. coerulea*), *V. Robina* (*V. teres* x *V. Sanderiana*), and *Renantanda Titan* (*V. Sanderiana* x *Renanthera Imschootiana*). All of these hybrids make a good appearance, but the best characteristics of the parents have been lost. The form of the flowers is rather disappointing. This goes to show that *V. Sanderiana* makes a poor parent, in the first generation at any rate. It is possible that re-introduction of this fine species into second generation crosses may help to emphasise its influence in its hybrids."

—*Anggrek Boelan, February,* 1940.

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● Mr. C. Gosper showed *Cypripedium Godefroyae,* the dainty plant and small white flower spotted with purple, being admired. A seedling plant of *Laelia tenebrosa* in flower was another of Mr. Gosper's exhibits at the February meeting.

● *Dendrobiums,* in common with all other plants, lose much of their strength during the flowering period, and at the time when their last flowers have withered their vitality will have reached its lowest state. Every care will be required to resuscitate the plant, and any indiscretion, such as premature potting, will invariably produce an ill effect on its health. In many cases the plant has produced a new growth several inches in height during its period of flowering and, also, during the time that the compost has been kept comparatively dry. This renewal of growth is a great temptation to give an immediate supply of water to assist its development, but such must not be done, for the sudden change from a long period of dryness to one of moisture often brings about the damping off of the growth. There is still plenty of nutriment left in the old bulbs to supply this new growth with food for several weeks, and, when in due course new roots are formed, only then may water be applied with any degree of safety.

Things of Beauty

Some of the Orchids of Southern Queensland

J. MURRAY COX, *Brisbane, Q.*

● "A thing of beauty is a joy forever — its loveliness increaseth," sang the poet Keats, and therein spoke truly, for the remembrance of the beauty of Nature's glories lingers long in our minds, and with the memory their loveliness increases always as a comparison with the more drab associations of our daily life.

We, whose particular joy lies in the production of glorious blooms, are sometimes rather prone to overlook the peculiar charm of our native Orchids in our enthusiasm for rare exotic blooms. But while we must freely admit that the Orchids of South Queensland have not the magnificence of their foreign brethren from a horticultural point of view, we can honestly claim that they are possessed of great charm when discovered growing in their natural surroundings; and some of that charm lingers when they are transferred to grace a tree in a garden, or to fill a space in the bushhouse of an Orchid lover.

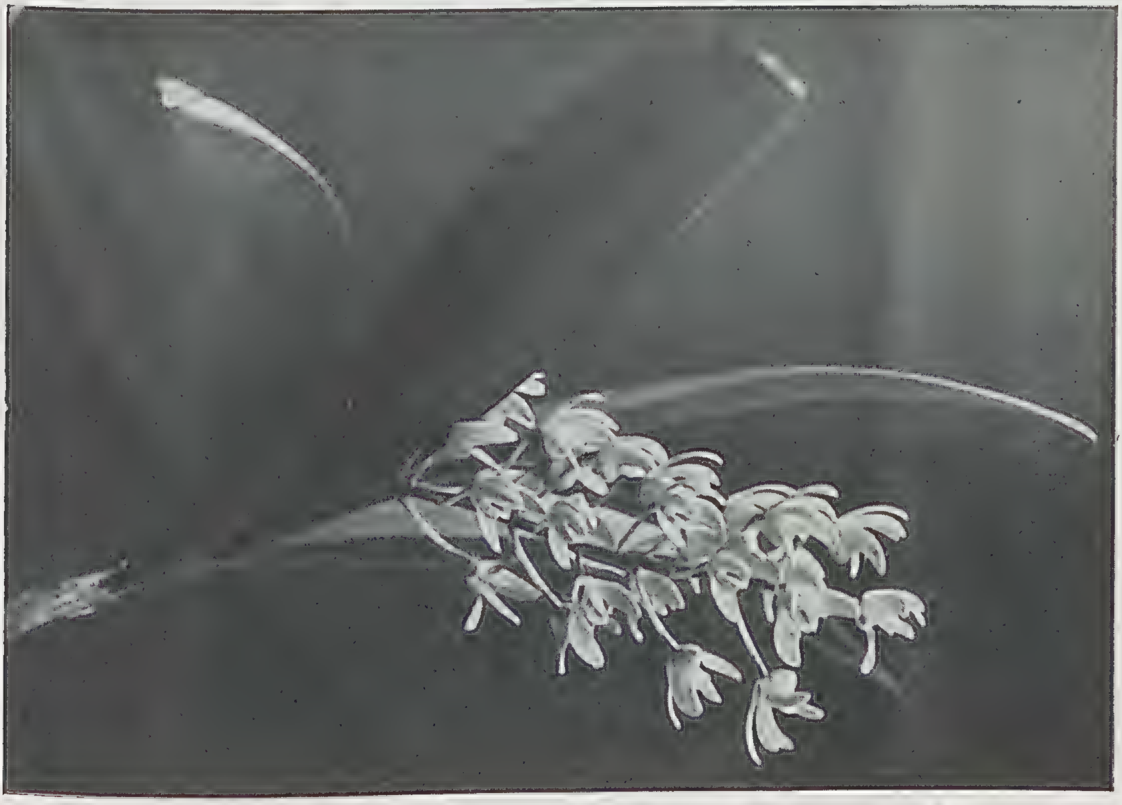
Probably the happiest hunting grounds for the Orchid lover who wishes to study the native genera in their own haunts are the Main Range and its spurs. There are many places on the range where the vandal's foot has never trodden, and here our native Orchids grow in riotous profusion. It is to a few such haunts that I wish to take you in thought, and of which I will endeavour to paint a few word pictures that may convey to your minds something of the memories of loveliness that I carry in mine.

Dendrobium monophyllum is a dainty little flower with its golden-yellow spray of bell-like blossoms, but on account of its small manner of growth we are apt to treat it with little regard. Picture, however, a great rock higher than the walls of a room, and about 15 feet long, standing a few feet from a precipice, with the whole of its eastern face densely covered with myriads of these golden hued blossoms gleaming in the morning sun which has just peeped over the eastern hills. The dawn rays seem to gain in refulgence as they light upon the blossoms, and the air is filled with a delicate fragrance. It is a memory that lingers in my mind always—which will remain long after the memories of many of our wonderful shows of exotic blossoms have faded into the mistiness of yesterdays.

I remember another sunrise when I wandered round a corner of a narrow ledge on one of the spurs of the Main Range, and saw on the face of the cluff just round the bend a great mass of *Sarcochilus Hartmannii* in full and glorious blossom. In the cool crystalline air of a mountain morning they too were a sight to cause a catch in one's throat, and they too are a memory whose loveliness ever increaseth.

Cunningham's Gap is a passage way through the Dividing Range, making a direct route between Brisbane and Warwick. On the south side of the Gap is pyramid-shaped Mount Mitchell, and on the northern side is Mt. Cordeaux towering 4,000 feet skywards. The lower slopes of these mountains are covered with a dense scrub through which great trees push their way sunwards. Almost every tree has its upper portion shrouded with great clumps of *Dendrobium speciosum.* At the time of my visit (September) these were all in flower, and the long sprays of cream coloured blossoms with here and there one of the rarer white variety (*Hillii*) made a charming sight upon which one never tired of feasting. On the trunks of the box trees, and occasionally on the pines and oaks, were clumps of dainty *Dendrobium aemulum.* Further up the slopes were clumps of the snow white *Sarcochilus falcatus* which gleamed when the furtive rays of the sun stole through the leafy mantle and kissed their white petals. But right on the rocky cliffs at the head of the mount was the crowning glory of all. Great masses of *Dendrobium Kingianum* with numberless blooms running the whole gamut of colour from pale lilac to a deep purple which would have mocked the robes of an Emperor, and with a fragrance like the incense from an old Cathedral. One almost listened to hear a voice proclaim "Take off the shoes from thy feet for the place whereon you stand is Holy ground."

I remember, too, a ramble I made a few months ago to a part of the Lamington Plateau down beyond Tambourine. A small party of us descended to the bottom of what is known as the Black Gorge—a fascinating place which would not fail to touch the imagination of anyone with a trace of the romantic in his make-up. In little grottos here and there in the course of the descent were rills and tiny waterfalls dropping a few feet in gradual descent before they took their final plunge over the edge of the gorge to the black depths many hundreds of feet beneath.



DENDROBIUM SPECIOSUM, *Sm.*
var. gracillimum Rupp

Blooms October (usually); dorsal sepal 16 m.m. (⅝in.) long; colour varies from canary to lemon yellow; distribution New South Wales and Queensland.

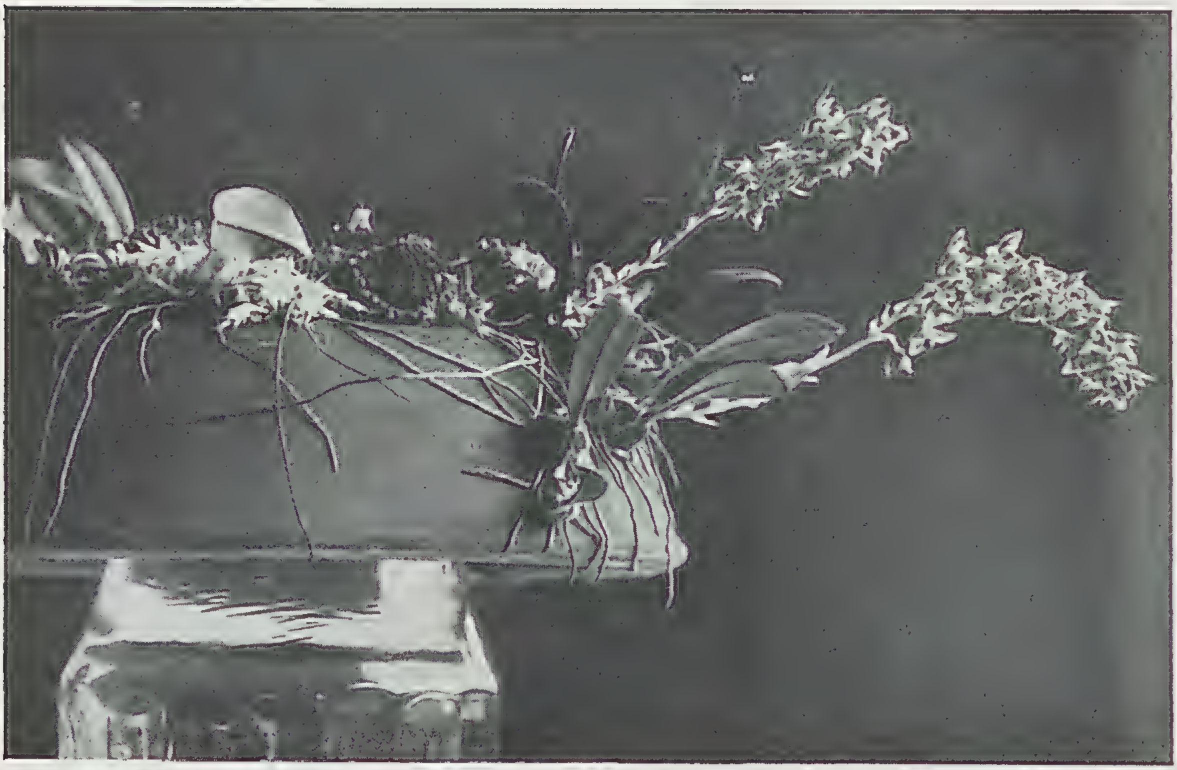
Grown and photographed by P. A. Gilbert.

Most of these grottos were quite damp, although the sun shone into them, and in nearly all of them were clumps of *Sarcochilus Fitzgeraldi* in bloom. But it was when we reached the bottom of the gorge itself that I had my greatest thrill. A tree had fallen athwart the stream which rushes down through the gorge to swell the Albert River. By chance the place that it spanned was one of the few places in the depths of the gorge that the sun's light could reach. The log was covered with the finest specimens of *Fitzgeraldi* that I have ever seen. The growths were up to eighteen inches high and mostly had long sprays of flower. I measured one or two of the individual blooms and found them to be very nearly an inch and a half in diameter. I may say that it took a supreme effort on my part to refrain from breaking my promise not to remove plants from the National Park area!

Another Orchid which is little esteemed by us is that rather odorous flower *Liparis reflexa,* but I remember seeing a cliff face near the top of Wilson's Peak down on the New South Wales border which was simply a mass of the honey coloured blooms. Coming suddenly upon the vision it was quite a charming sight worthy of being treasured in the memory gallery of things of beauty.

To be continued

● Judge Markell has had experience with the borers which are partial to *Dendrobium Phalaenopsis* and found that soaking the plants in a weak solution of permanganate of potash is effective. *Vanda* beetles, which cause a darkening of the foliage, are best treated with nicotine.



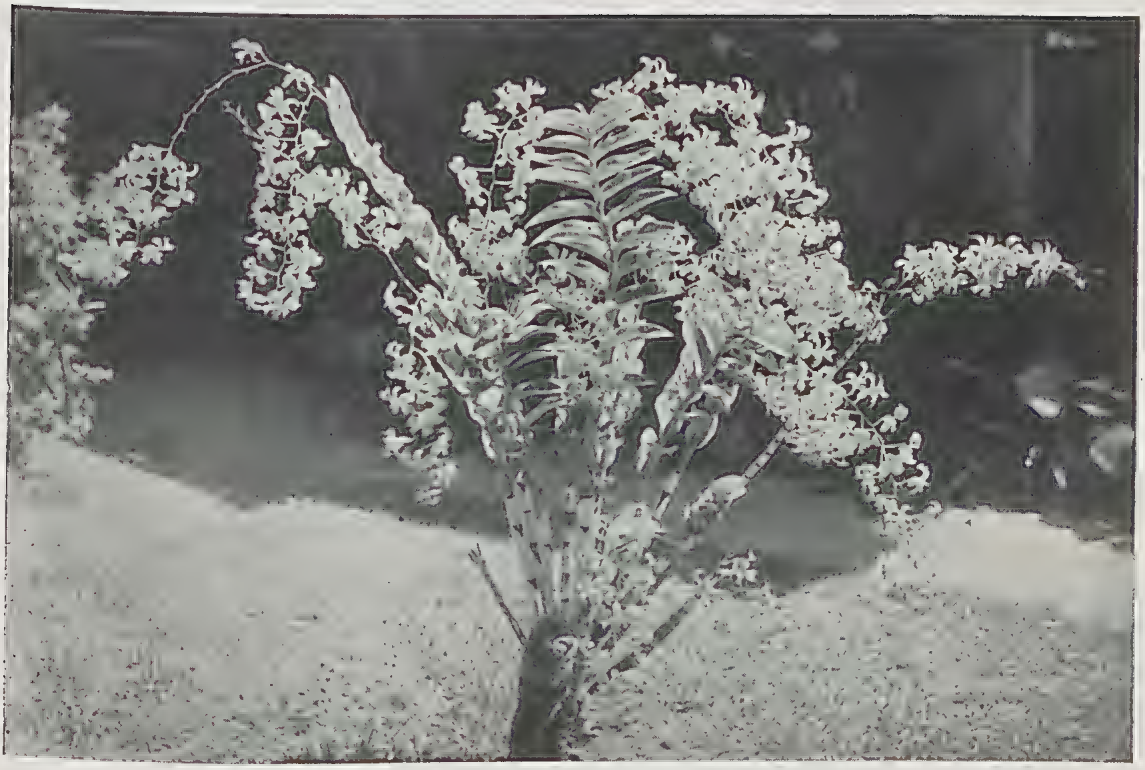
BULBOPHYLLUM (ADELOPETALUM) BRACTEATUM *Bail.*

B. globuliforme Nicholls also showing—small white flower and chain of pseudobulbs like pins' heads. See a note below.

Grown and photographed by P. A. Gilbert.

● *Bulbophyllum bracteatum* blooms during October and November. It is distributed mainly over Southern Queensland and Northern New South Wales. The larger spike of the illustration measured 3½ inches long, 14 bracts occupied 1½ inches of the stem, and 29 flowers the remaining 2 inches. Flowers 7 to 8 mm. across, closely packed. A full description is contained in Qld. Fl. p. 1539 by F. M. Bailey. The species was described as *Adelopetalum bracteatum* by R. D. Fitzgerald in the Journal of Botany for 1891, page 152, but botanists generally have adopted F. M. Bailey's revision. Although Fitzgerald's drawing (Vol. 2 Australian Orchids) of the pseudo-bulbs is more or less representative, the racemes are rather poor in colour and size compared with those produced by plants collected in Northern New South Wales. I have tried several methods of cultivating the species, but the most successful is that of placing the plant on an inverted flower pot saucer resting on a bottle of water, with sphagnum moss, sand, and powdered cow manure as the compost.—P.A.G.

● "My Orchid garden is laid out on top of a hill, elevation 4,500 feet, but sheltered by the Great Western range, which screens off the full blast of monsoon winds and rains, so that we are well protected from storms, and do not get as much rain as places round about. Everyone who comes here remarks on the vigour and health of my Orchids, and this I attribute to the situation and climate, and nothing else. *Vanda coerulea* has always flowered well in my garden for a number of years, but this year (1939), after the three months' drought, my plants excelled themselves, and I had over 200 sprays out at the same time in January. It was a really glorious sight, and wherever one looked in my Orchid garden there was a beautiful mass of blue to delight the eye. Prominent in this floral display were the flowers of the dark blue variety, very distinct by the large size and rich colour of their blooms."—Miss M. Tilley, Talawakelle, Ceylon, in *Orchidologia Zeylanica, Vol. 6, No. 4.*



DENDROBIUM SUPERBIENS, *Rchb. f.*
Grown and photographed by H. T. Wooster, Townsville.

● *Dendrobium superbiens.*—The plant illustrated was grown by me on an open lawn in an easterly aspect. It flowered last year from January to the end of August, producing 21 sprays with up to 20 flowers on a spray. It commenced flowering again at the end of September, carrying 12 sprays, finishing on February 20, 1940, and immediately after flowering spikes were again in evidence. Last month (January) the plant made 5 new pseudo-bulbs. —H. T. Wooster, Townsville, N.Q., 20/2/1940.

● "*Dendrobium Salak*—Salak is the name of a mountain in Java—is a cross between the beautiful *D. stratiotes* and a pink variety of *D. undulatum* from Australia. The attractive flowers are nearly three inches across. The sepals are of a reddish colour. The petals are two inches long and twisted, the colour being dark lilac. The lip is white with purple markings, and very similar to those of *D. stratiotes.*"

—*Anggrek Boelan, February,* 1940.

● Two years ago I started cross-fertilizing or hybridizing Orchid flowers in my glasshouse. (By the way, I never buzz or pretend to have wings during the process). I have been successful in germinating the seed on sterlized compost in pans but the seedlings have always faded out before they developed leaves and roots. Consequently, I tried a small quantity of seed direct on the compost of a female parent. Result—24 healthy youngsters having both leaves and roots. Two plants have leaves half an inch long. Their parents are *Phalaenopsis Schilleriana.* x *P. grandiflora. P. grandiflora* is the host or female and is established on a slab of N.E. Indies black tree fern. Size of slab 14 ins. x 6¾ ins. It is suspended in a vertical position. Most of the young seedlings have established themselves close to the upper and lower roots of the plant. I have often seen odd plants raised by this method but never such a batch as this. It would be interesting to know if other growers are having any luck with the direct method.

—Wm. F. Adamson,
Bulimba, Qld., 25/4/40.

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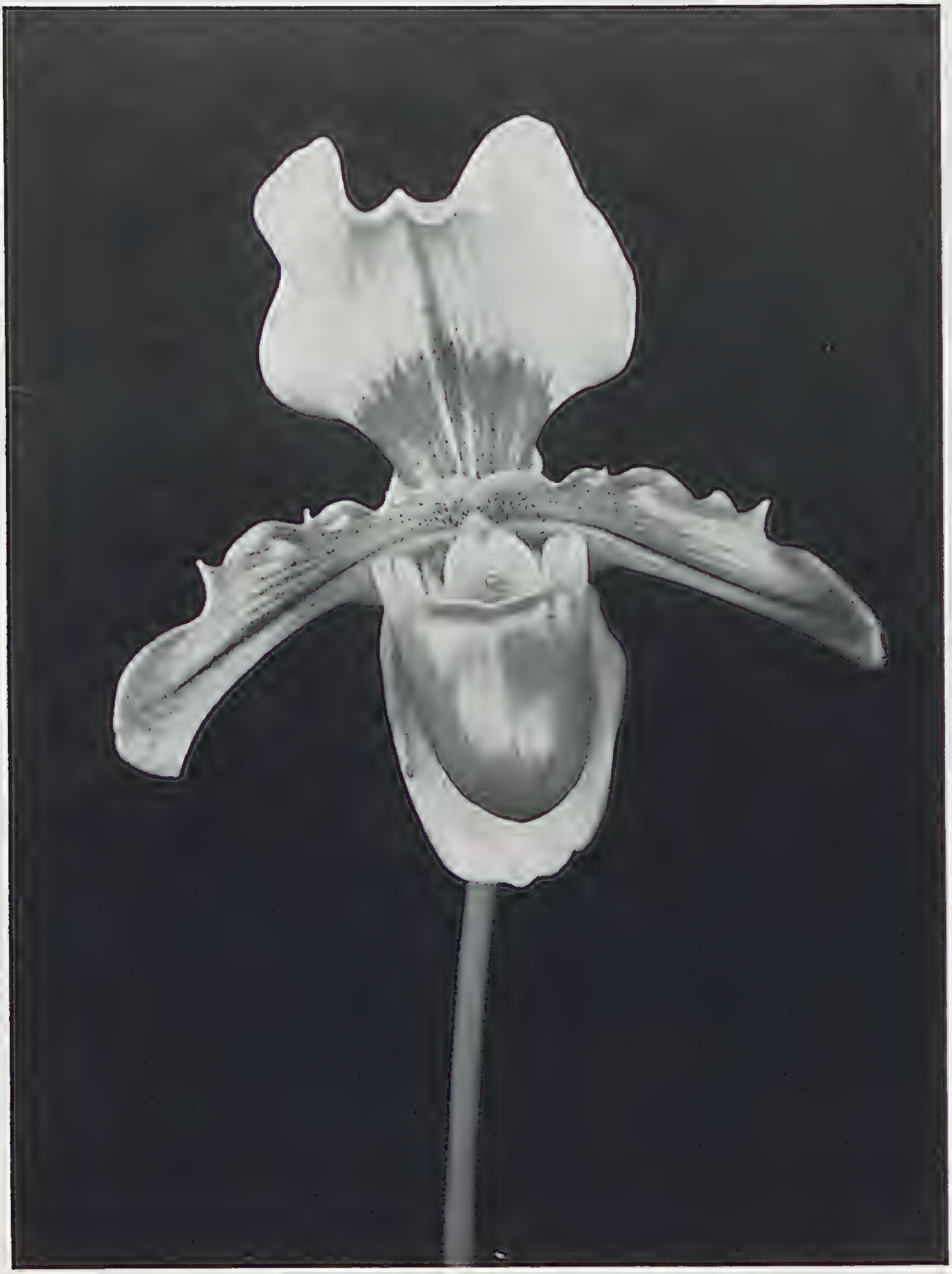


CYPRIPEDIUM BIANCA X C. CHRYSOTOXUM

A pretty hybrid, with a fine white dorsal sepal, 2ins. across, and an apple-green blotch at the base. The petals and labellum being yellowish-green striped with red. Photograph natural size.

Grown by T. C. Harveyson, Qld., Photo by Dorothy Coleman.

Australian Orchid Review

Editorial

The Aim of the Hybridist

● The hybridist has succeeded in placing in the hands of Orchid growers some superb examples of the science of hybridization. It cannot be overlooked, however, that for every prize specimen produced, myriads of good, mediocre, and inferior examples have also come into existence. All these results are partly out of the control of the hybridist, who simply combines the unstable elements in plant life, selecting from generation to generation the types that approach his preconceived ideals of horticultural standards.

The hybrids of lesser quality have to be placed on the market to help compensate the breeder for his outlay in creating a few notable specimens, otherwise if the ordinary plants were discarded the notables would have to be reckoned, not in tens of pounds, but in hundreds or more each. Thus, the hybridist with his stock of cheap and expensive plants, is able to meet the longings of everybody.

Calanthe Dominii (*C. masuca x C. furcata*) is of historical interest, being the first horticultural hybrid to flower, but not the first seedling raised artificially. It flowered during October, 1856, and was raised by an employee of Veitch and Sons named Dominy. Since 1856 some curious things have happened in the field of hybridization. Multi-generic hybrids, weird and beautiful, have been produced which have upset some of the definitions of a species, and if Darwin was alive to-day he would probably scratch his head, tear up the Origin of Species and write the Origin of Genera or Families.

The greatest achievements seem to have taken place in the building up of the *Cattleya* group. The full and richly coloured labellum, the rigid and wider sepals, and the broad petals combine to add balance and symmetry which is lacking in many of the species. The hybridist has succeeded in producing the artist's flower. The requirements of the horticulturist are in opposition to those of Nature. In Nature it matters little whether the sepals roll back or not, so long as the column and labellum are free for the operations of insects.

The English hybridists have produced some charming *Dendrobium* hybrids mainly working on the section *Eudendrobium* (*nobile,* etc.). In Java, breeders have concentrated on the sections *Ceratobium* (*undulatum,* etc.) and *Phalaenanthe* (*superbiens,* etc.), producing a series of eminently distinctive hybrids suitable for Java, similar climates, and equivalent hot house treatment. Generally these hybrids are dissimilar to the productions from the *Eudendrobium* section. The high state of perfection attained places before the Orchid grower an amazing selection of elegant *Dendrobiums.*

It is a matter of opinion as to whether the *Cymbidium* is gradually losing its orchidaceous charm in its transition towards the gladiolus-like structure. The aim of the hybridist seems to be to create balance and roundness, to fill up the spaces between sepals and petals. Is he overdoing this? Some growers say "yes."

The extent to which the hybridist is reducing the "pouch" of the *Cypripedium* suggests that he is well nigh a wizard. The enlarged and rounded dorsal sepal, the wider and rotund petals, and the more prominent ventral sepal are wonderful results to which the reduction of the "pouch" seems complementary. The hybridist is taking away from the "pouch" to add to the perianth. The modern effect is somewhat pansy-like. Assuredly the aim of the hybridist is to give us something new in colour and form, or to improve what we already have according to his ideals of improvement. Although Nature is elastic in yielding to his efforts, her elasticity is not unlimited, and probably the limit is approaching in regard to colour, size, and shape.

The production of modern hybrids entails the expenditure of large sums of money, consequently high prices are demanded in the open market. The poor man still can stage the typical species and commoner hybrids, leaving the rich man to parade the novelties of human ingenuity. The hybridist is the backbone to the cultivation of Orchids. He has expanded the horticultural aspect besides establishing many scientific truths as regards plant genetics. Without his labours Orchidology could never have grown to its present proportions, attracted so many adherents, or given so much employment, directly and indirectly.

Cool House Culture and Notes for Amateurs

T. H. JAMES, *Longueville, N.S.W.*

● Another Spring has arrived and a busy time is ahead for Orchid growers. It is also the most beautiful and interesting season, beautiful because during that period the majority of Orchids provide their glorious display, particularly the *Dendrobiums* and *Cymbidiums;* interesting, as new life is coming into action, and we wonder whether our plants are going to do as well or better than in the past. I may be prejudiced in my fancy, but, to me, the display that a well grown collection of *Dendrobiums* can give is entrancing, and surpasses all others. They seem more friendly, with their riot of colour, than the stately *Cattleyas*, or the rather subdued tones of the majority of *Cymbidiums.*

Probably the principal job ahead is repotting. I have been asked more than once: "Should every plant be repotted in the Spring?" I do not know how this idea originated, but repotting is not a procedure which automatically follows the advent of spring, but is necessary only when a plant has become pot-bound, and has thus exhausted the nutriment originally contained in the compost, or its leading bulb having reached the edge of the container, there is consequently no room for further bulbs, or the plant is not flourishing.

Should a plant, in a reasonably suitable environment, refuse to progress, there is something wrong with the compost. In such a case take it from its container, remove all compost, cut off all dead or unhealthy roots, thoroughly wash and repot in a fresh container with new materials. If repotting be necessary owing to the container being too small, avoid as much as possible disturbance of the roots. Should the compost seem decayed, carefully extract and replace it with fresh material before placing in a new vessel. With epiphytic Orchids repotting should not be attempted until new root action is seen. If that could be anticipated by a few days, so much the better, but any disturbance while the plants are at rest is generally most harmful. For terrestrial Orchids, a good plan is, as suggested in the last number of this Review, to turn the pots on their sides and hose out much of the soil, that is, if larger vessels are not needed. Fresh compost can then be filtered in.

The Glass House

I prefer the floor of my glass house, and also bush house, to be of earth with a pathway of concrete, or other material. In the soil I grow *Begonias,* ferns, etc., which, I believe, help to generate a congenial atmosphere, and improve the humidity in the warm weather. At this time of the year this soil would be improved by being forked over and given a light dressing of lime, which would help to correct any undue acidity, and also clean up insect life.

From now on a certain amount of shading will be required. An experienced grower who has tried many methods informed me that he obtained the best results by painting the glass on the *inside* with mill white. By applying on the inside an even shading is maintained during the whole period desired, and it is very easily removed at the beginning of winter, when everything then is under clear glass. I used to believe in painting the outside of the glass with white oil paint, but found by the time winter arrived that much of it had been washed off, leaving the surface patchy. That which had not been washed off refused to move without the assistance of a paint remover. If that job is shirked—I confess to having done that myself once—repainting will result in many sections being too dark. For blinds I use only the coarsest scrim, and even those are only let down on very hot days. Last summer I steeped the scrim in the preservative advocated by W. H. Slade & Co. To date the blinds are well preserved, but it remains to be seen whether they will withstand the onslaught of birds at nesting time, which find it an excellent building material, always attacking the blinds at the top. As to the bush house, keep those vines in check. A vine-covered bush house is useless for Orchid growing.

Dendrobiums will soon be in full blossom. Those grown in heated houses will be either at their best or past it. If possible, take them out of the bush house if rain should develop. A verandah, glassed, or open if facing north or east, will serve. As the buds begin to swell, give the plants more water and keep them just moist. By this time new growths will have started. Do not water heavily until new root action is observed, as much water may cause the young shoots to rot off. When root action has started, generally soon after the flowers have passed, top dress with peat moss. I used this last year instead of sphagnum and found it beneficial. It is apt, however, to cake if allowed to get dry and water will not penetrate but merely run off. It should, therefore, always be kept moist. One grower told me that mixing a little tan bark with the peat moss reduced that caking effect. Do not mix the peat moss in with the compost, as it holds too much moisture during the winter, which is a handicap, particularly in the bush house. If any repotting be necessary I would strongly urge the use of fibre only. This entails more frequent watering during the summer months, but there is much less danger of over-watering during the cold months, either by hose or rain.

Now as to those back bulbs. I noticed in all illustrations of flowering specimens, particularly of *Dendrobium nobile,* that two growths only were existing, that is, the current year's growth, and that of the previous year. After two years the roots on the third bulb back were mostly dead, and it existed on the nourishment obtained from the roots of the leading bulb, all of which nourishment should be concentrated on the new growth. If it be possible, I would suggest cutting through the connection between the second and third back bulbs. In most cases this will cause the bulb behind the cut to make a growth, and so your plant will be built up more rapidly. If that is not practicable—and it may not be in some large newly imported clumps—merely cut off the back bulb close to its base and discard it, or, if preferred, lay it on some live moss to induce some aerial growths. This can be done as soon as flowering has finished, and applies to most of the *Dendrobiums. Cymbidiums* can be treated in the same manner. Two bulbs behind the new lead are sufficient. With *Cymbidiums,* however, it would be better in most cases to take the back out altogether and place in peat moss or sphagnum until shoots and roots appear and then pot. If the severing of back bulbs would result in a more balanced plant, leave it in the original pot. Frequently the number of bulbs will force the outside ones to slant over the edge of the pot. If unable to cut out the old centre bulbs, twist them off and this will enable the newer bulbs to be straightened up and leave room for new growths, thus deferring repotting.

Cattleyas can also be treated in this way, but more bulbs behind the lead are believed to be necessary. In England five bulbs are claimed to be necessary, but Mr. Cooper, of Sanders, in letters to me, said that under Australian conditions three bulbs should be sufficient. Why *Cattleyas* should require more bulbs behind the lead than *Dendrobiums,* I cannot say. Personally, I do not make any definite statement, as, so far, I have not exceeded Mr. Cooper's opinion. I have treated all my *Cattleyas* in this manner and now have four to six leads on several. In two cases back bulbs made new growths which flowered the first year. Certainly the treatment has not so far affected the new growths.

While on the subject of *Cattleyas,* there is one matter I intended to mention in the last number of this Review but forgot to do so. Some *Cattleyas,* such as *Trianae, Mossiae,* and others, produce sheaths in the autumn but the flower buds do not appear sometimes until late winter or early spring. These sheaths will frequently become dry and paper-like. In this condition they will absorb moisture, and if not carefully watched the buds will rot long before they can emerge. A good plan in such cases is to open the sheaths, and thus prevent the settlement of moisture on the growing buds. This suggestion will probably be too late in many cases, but still may be useful. Those who propose trying *Cattleyas* in a cool house should endeavour to get only those that flower in the summer. Flowers do not develop well in winter without heat.

Cypripediums.—At a recent meeting of The Orchid Society of New South Wales Mr. Lewis G. Cohen showed about twenty of his wonderful *Cypripediums.* These are grown in pure tan bark only, and the growth is certainly amazingly luxuriant. The flowers were on long rigid stems and looked actually radiant. To most of the members present they were a revelation. Several growers have tried tan bark with no success. The secret is copious watering. Most of the year the plants are freely hosed every day and even in winter two to three times a week, but not so much overhead then.

In any compost I believe much dryness at the roots is distinctly harmful. It may not be immediately apparent, but ultimately will cause a setback.

Cymbidiums.—Flowers will now be at their maximum and, judging from early promises, should be very plentiful. Unless required for some specific purpose, do not leave the flowers unduly long on the plant, particularly if the plant is weak. The flowers will keep well, even when cut. If left over long the effect may be to retard new growth, resulting in no flowers next year. This applies particularly in the case of large specimens with many spikes. Even if, in such cases, the spikes be cut early, the tendency is to a lighter flowering the following year. As with many flowering plants, a heavy flowering frequently has an exhausting effect which causes a light flowering, or none at all, the following season, enabling the plant to rebuild its resources.

From now on more frequent watering will be required, and after new growth has started, cooler conditions could be given, but still plenty of sunlight. Direct sun up to mid-day would, I believe, be beneficial. I prefer, during the summer, to place the pots on the ground. The pots absorb moisture from the earth and the roots are cooler. I find it a good plan to scoop out a small hollow under the centre of the pot, as otherwise the drainage hole may become clogged and the pot waterlogged. If earth grubs be about, a piece of wire gauze or perforated zinc either over the drainage hole or underneath the pot would prevent their entry. Applications of liquid manure about every ten days would be beneficial.

Thunias.—These should be now sufficiently advanced to receive copious watering, and regular applications of liquid manure. Keep in open sunlight, but sheltered. Flower spikes should be apparent about the end of November.

Coelogyne cristata should now be in full flower, although some may be past their prime. Those grown outside would, I presume, be under cover while in flower. When flowering has finished, place them outside again. I find other *Coelogynes* do better outside. When I say outside I do not mean in a bush house but in the open garden exposed to full sun for several hours each day, but protected from strong winds. *Coelogyne Massangeana* makes a more sturdy growth and flowers more regularly grown outside than under glass.

Zygopetalum Mackayi.—A writer in the June Australian Orchid Review refers to his inability to flower this Orchid. I was unable to flower it while I kept it in the glass house where, also, the foliage was long and apt to spot. I placed it outside among the *Cymbidiums* and it flowered the same year, one growth producing two flower spikes.

Phaius.—I kept my *Phaius* in the bush house as long as possible. About the end of June I noticed that the leaves of *P. grandifolius* showed a slight yellow tinge. I therefore placed it in the glass house and the yellowing ceased. It is now in spike. Others, such as *P. Norman* and *P. Wallichii,* are still in the bush house and growing well. *Vanda coerulea* is a comparative failure with me. I am still experimenting, and hope some day to find a treatment to which it will respond.

Vanda teres.—I had a number of plants of this species growing in a large basket in what may be termed an open *Cymbidium* mixture. They were out in full sunlight, and in the hottest place I could find. They grew well, rooted well, and flowered. A friend with whom I have frequent discussions about our Orchids, and often have differences of opinion, told me they would not succeed here in that compost, and that the roots would ultimately die. I disagreed with him, but now have to confess, reluctantly, that he was right. Everything was grand for a considerable time, and I then found that nearly all the roots in the soil had died. I have now to find some other treatment for my conditions.

General Notes

I referred, in a previous article, to altering the suspension of a plant of *Oncidium* growing on a block of fibre. I noticed that when I altered the suspension for the second time—the plant would then be in the reverse position to that when first grown—nearly every back bulb made a new growth without any division of the rhizomes. It would seem that, as the natural movement of sap is upwards, the reversal of the plant forced the back sections into new life. There may be possibilities in this.

I have noticed from time to time that *Cattleyas* refuse to flower, although the growth is excellent. In such cases I would suggest placing these plants right out in the open and in full sunlight, giving copious waterings while new bulbs were being made. The position should, of course, be protected from the south and west. If no flowers result, dry severely during winter, and place in coolest part of glass house. Out in sunshine again the following spring. I know of two instances where this practice induced flowers.

An unexpected effect of manuring may be of interest. A plant of our native *Cymbidium suave* was given liberal doses of cow manure. The flower spikes appeared in due course, but instead of the usual 9 to 12 inches of length they grew to over three feet. However, the spikes carried no more than the usual number of flowers of ordinary size, and spaced about six inches apart.

In the June number Mr. Dignam inquired regarding certain *Dendrobiums*. Some of those mentioned have not been too successful with me. I will make inquiries and hope to be able to reply in full in the next number of the Review.

Things of Beauty

Some of the Orchids of Southern Queensland

J. MURRAY COX, *Brisbane, Q.*

Continued from Vol. 5, No. 2.

On another occasion after breaking through a belt of thick undergrowth into more open forest country, I became aware of a sweet perfume; looking round for its origin I was delighted to find a fine specimen of *Galeola* in full flower. This strange Orchid grows from a tuberous root deep down in the earth, it has no leaves but sends out a long brown stem up to half or three-quarters of an inch in thickness which, fastening on to a large tree trunk by means of clusters of adventitious roots, ascends forty to fifty feet. It sends out numerous panicles about 18 inches or two feet long densely covered by yellowy brown flowers each of which is about two inches across. The labellum is pink and white with a crinkled edge. A beautiful thing but alas! of no value to the horticulturist, as it will not bear transplanting—but suddenly to come across one in full bloom is to add another treasure to your store of beautiful memories.

The Orchids I have mentioned so far have all been of the epiphytic type, and most of them, in individual cases at any rate, are well enough known to most of those present to-night. But we have in Queensland many terrestrial or ground Orchids which in their own way are beautiful.

In my young days I remember the joy we had in getting great bunches of the little purple ground Orchid *Glossodia minor,* which we used to call Spring Stars. I have seen the ground in certain coastal districts turned into a rich purple carpet by the multitude of these little flowers. They were a lovely thing, and now in my graver years I have twinges of conscience at the memory of the many thousands of these I plucked as a youth. But young though I was at the time, I still cherish memories of those royal carpets in the clearings amid the gum trees near Scott's Point.

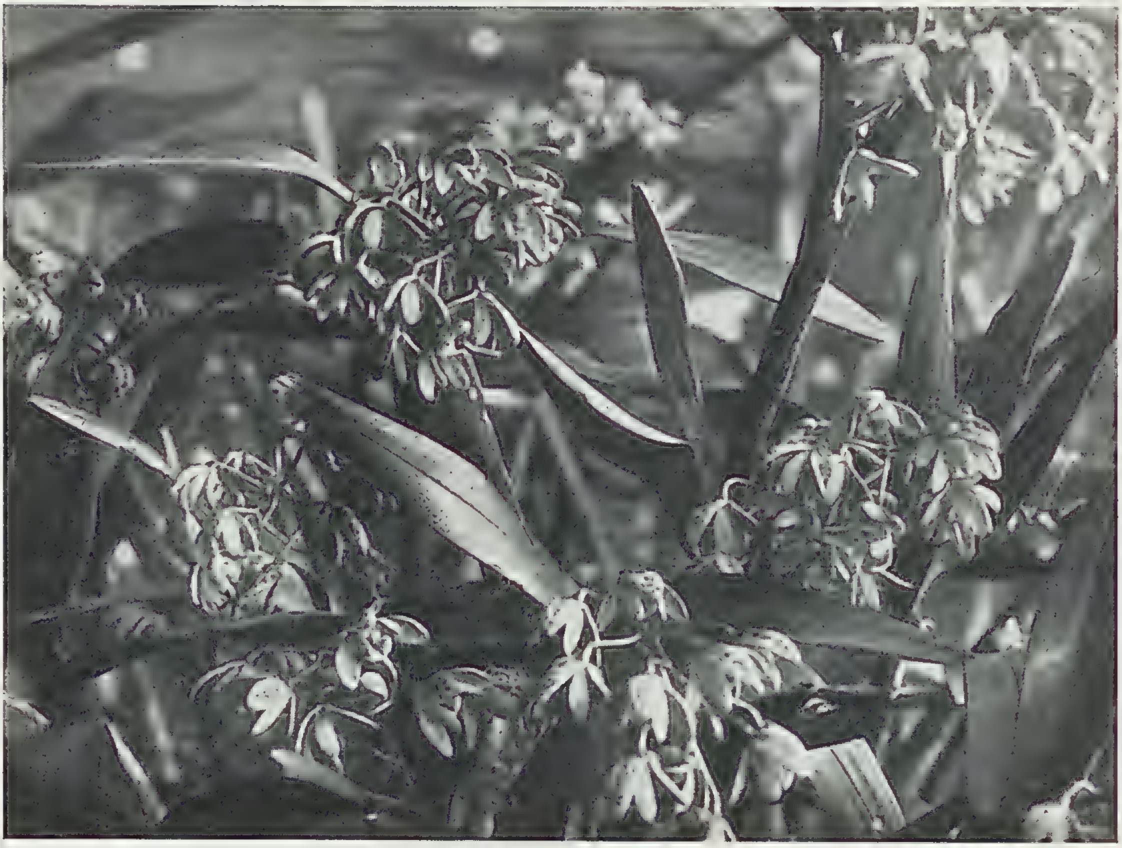
Recently a member of this Society showed a little clump of *Corysanthes bicalcarata* (or Helmet Orchid) at one of our monthly shows. Some of those present were inclined to be facetious at the expense of this tiny flower as compared with the striking blooms of *Cypripediums,* staged near it. But I have seen that same little flower growing in a massed formation under natural conditions. I can assure you that the sight of some hundreds of these blood-red flowers backed by the deep green of their foliage is one of my treasured memories.

I have always recommended any beginner in Orchid culture to start off with a few local Orchids, and to use these as a means of building up his technique in potting and general culture. But I do not by any means suggest that our South Queensland Orchids are only suitable for the inadept handling of the neophyte. On the contrary, I consider that every Orchid grower should have in his collection a representative selection of the local Orchids. If we treat these plants as Orchids and not as something between a freak and a weed, we will find ourselves amply recompensed in the resultant growth. Take little *Dendrobium aemulum* for example. I recently saw a large-sized pan completely filled with this plant in full bloom, and a lovelier sight it would be hard to find.

In my opinion a plant or so of each of the following Orchids will add interest and beauty to any collection:—*Dendrobium speciosum* with its varieties *Hillii, D. Kingianum. D. falcorostrum, D. gracilicaule* and its hybrid *gracillimum, D. tetragonum*—a specimen plant of which is a beautiful sight when in full bloom, *D. aemulum* and *D. monophyllum* already referred to, *D. linguiforme*—a dainty and very prolific blossomer which is always a joy in the early spring, *D. cucumerinum,* which, while distinctly curious in its manner of growth, flowers very frequently—my specimen seeming to flower on and off throughout the year. *Cymbidiums iridifolium, suave,* and *canaliculatum* are all worthy of a place in your collection, *Sarcochilus Hartmannii, S. Fitzgeraldi, S. falcatus, S. Cecilae* and *S. divitiflorus* have charm and interest, the two first named of this group being sought after by overseas growers.

As to our terrestrial Orchids, the beauty of our *Phaius grandifolius* is famous and, with *Calanthe veratrifolia,* is worthy to be in any collection of Orchids for their floricultural value alone. But in addition to these many of our host of small ground Orchids under proper treatment will repay the care taken of them and reward the grower with beautiful blooms.

By reason of the fact that their natural grow-



DENDROBIUM ELONGATUM *Cunn.*
Commonly known as D. gracilicaule F. v. M. Distribution, Queensland and New South Wales.
Flowers September to October. Sepals about 10 mm. long.
Grown and Photographed by P. A. Gilbert.

ing places are so handy, thus enabling us to get a thorough knowledge of their requirements, the cultivation of our native species presents very little difficulty even to the beginner.

The *Dendrobiums* generally are sun lovers, and will do well grown out in the open attached to a tree trunk, or a post, or properly potted up in a basket, pot or raft. If potted, good care should be taken of the drainage, for long periods of damp feet mean death to an Orchid just as it may do to you or me. The best potting material is staghorn or elkhorn peat, and care must be taken that the Orchid is planted on the compost and not in it. Those *Dendrobiums* that grow on the open forest trees, such as *tetragonum, teretifolium, gracilicaule,* etc., need less water than the rain forest or scrub Orchids, such as *speciosum* and *aemulum.* But no variety of *Dendrobium* needs too much water, and in the winter months practically none need be given.

The native *Cymbidiums* do well in basket or pot in a peaty compost, though a mixture of sand, old dung, leafmould and fibre or peat suits them equally well. They like a reasonable amount of water during the summer months, but are very adaptable to almost any surroundings. I find they do best out in the open hung from a tree where they can get the morning sun, but where the fierce noon-tide rays are broken by overhead foliage.

Sarcochilus Hartmannii grows on the cliffs of the mountain ranges exposed to full morning sunshine. It grows well for me in a compost of sand, leafmould and charcoal which approximates very closely its natural living conditions. It does not require very much water.

Sarcochilus Fitzgeraldi, however, grows in the cool, moist gorges. I grow it in a tray of sand and leafmould in a cool, damp part of the bushhouse, where it does quite well. I once saw a whole mass of this plant growing gaily among the damp charcoal screenings under and around the shelves of a bushhouse.

Sarcochilus falcatus seems to do best if it is left to grow on a branch of a tree, particularly a piece of crows ash or she-oak. It likes a cool location where it gets plenty of light but not too much of the direct rays.

Sarcochilus divitiflorus does nicely potted in peat and given fair sunlight.

Of the principal terrestrials, *Phaius* should be planted in a compost of loam, sand, leafmould and dung—a little bonemeal seems to be appreciated. Growing naturally as it does in marshy country, it likes plenty of water, particularly in the summer time. In the cool period less water is necessary, but I never let the plant get very dry.

Calanthe veratrifolia will grow in the same compost, but does not require quite so much water, although, like our Orchids generally, it is very adaptable to circumstances.

With regard to the other ground Orchids, so long as you approximate to the conditions under which they grow naturally, no great difficulty should be experienced in growing and flowering them.

The Orchid Club of South Australia

● The monthly meeting of the Orchid Club of South Australia was held on April 8, 1940, when a most instructive talk on "Orchids in general" was given by Mr. Hook, of Queensland.

In his breezy style Mr. Hook discussed various glass houses that he had seen during his travels. He discussed how magnificent *Cattleyas* flourished under the most primitive conditions, while others cultivated in luxurious surroundings wilted. Mr. Hook is evidently a most observant grower, and we feel sure that all members of the Club learned many good points from his talk.

During the evening a very fine display of Orchids was staged by the various members. The membership of the Club is growing rapidly, and before long it should be in a very flourishing condition.

The South Australian Orchid Display

An effort of outstanding interest to flower lovers took place in Adelaide on March 28 and 29, 1940, when the newly formed Orchid Club of South Australia held a display of Orchids in the Myer Emporium Apollo Dining Hall.

Adverse weather conditions affected the display somewhat, but after scouting among the various members for their blooms, the Committee eventually staged a very fine show of marvellous flowers. All kinds of Orchids were on view, including *Cattleyas, Cypripediums, Dendrobiums and Oncidiums.* As a first venture the Club was congratulated on the display by all who were fortunate enough to see it.

Mr. H. Greaves, of the Botanic Gardens, and Mr. F. Osborn supplied all the magnificent foliage plants which formed a wonderful background for the Orchids. Among these were *Crotons, Caladiums,* and palms of all descriptions.

The outstanding exhibits were the *Brasso-Cattleyas* exhibited by the President, Mr. F. De Rose, Mr. R. Rogerson and Mr. J. Linke. A magnificent specimen of *Brasso-Cattleya Melrose* was, in the opinion of experts, the best bloom in the display. The *Cypripedium* exhibits were not as numerous as they should have been. It was found that the date of the show was a little early for this type of Orchid. If it had been held another two or three weeks later there would have been hundreds more on display. The best bloom in this section was *C. Maudiae* var. *magnificum.* Among the *Vandas* the best bloom was that of *Vanda coerulea,* which was a delightful shade of blue.

The public generally was very impressed with the Club's effort, and the Committee feel sure that when they hold their next display, it will be on a much larger scale than this one. Many of the public who viewed the display enquired about the monthly meetings, and it is felt that many new members to the Orchid Club will be the result.

A collection was taken up during the two days, a considerable sum of money being raised for the Fighting Forces Comforts Fund.

● In response to the request that the City of Brisbane be represented at the opening of the Burnside Town Hall, Adelaide, and the Patriotic Fete associatel therewith, the Queensland Orchid Society provided the Orchids for a presentation bouquet which was forwarded by air mail.

A New Dendrobium from New Guinea

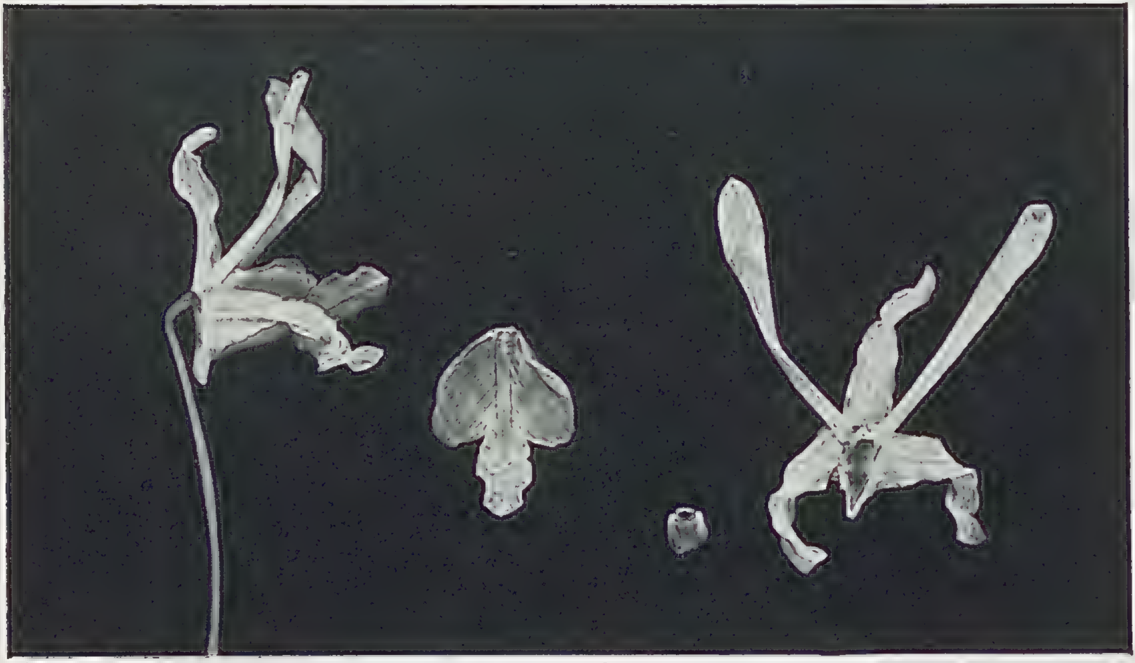
C. T. WHITE, *Government Botanist, Queensland*

● The number of Dendrobes of the "*Ceratobium*" section—which includes *antennatum, D'Albertisii, minax, antelope, undulatum, Tofftii, imperatrix,* and a number of others well known in cultivation—described from New Guinea is now legion, but additional ones continue to come in. Some time ago I was shown a beautiful member of this genus grown by Mr. Alex Grant, of Mackay.

In botanical sequence in Kraenzlin's monograph, I should place it next to *D. D'Albertisii,* of the subsection *Minacia.* On the other hand, it has some resemblance to members of the subsection *Mirbeliana,* and comes closest to the little known *D. Rosenbergii.*

As the international rules of botanical nomenclature require a new species to be described in Latin, the following is offered:—

Dendrobium Grantii sp. nov.—Rhizoma validum, repens. Caules validi, erecti, elongato-fusiformi, flavo-virides, sulcati, ca. 30 cm. alti, basi ca. 1 cm., medio 2-2.5 cm. crassi, inferne vaginati, superne foliati, internodiis ad 4 cm. longis, superioribus brevioribus. Folia patentia, basi in vaginam amplexicaulem producta, lanceolata, supra nitida, atro-viridia, subtus pallidiora, carnoso-coriacea 12-16 cm. longa, 3-4 cm. lata; vaginae tubulosae, internodia aequantes. Inflorescentiae elongatae, racemosae laxe ca. 22-florae, rachide viridi ca. 40 cm. longa. Bracteae 7-8 mm. longae, lineari-lanceolata, apice acutae. Sepala et petala alba. Sepalum dorsale 2 cm. longum, 5.5 mm. latum, oblique tortum, undulatum, sublineare, apice acutum. Sepala lateralia cum pede gynostemii mentum conicum leviter curvatum dorso viride formantia, linearia, undulata, torta, 2 cm. longa, in medio 4 mm. lata. Petala linearia, apicem versus gradatim dilatata, 3.5 cm. longa. Labellum trilobum, 2.5 cm. longum in parte inferiore cum lobis lateralibus 1.7 cm. latum, lobi laterales in parte inferiore luteo-virides, apicem versus violacei marginibus



DENDROBIUM GRANTII

From left to right—Flower (side view) Labellum and Column. Flower, face view (labellum and column removed). All figures natural size.

Photo Dept. of Agriculture and Stock, Qld.

integri; lobus intermedius 1 cm. longus, 6 mm. latus, violaceus, undulatus, subolongus, discus violaceus, tricarinatus, carinis, omnibus ad apicem in lamellam erectam, abrupte dilatatis, lemalla intermedia ceteras superante, 1.5 mm. alta. Gynostemium 7 mm. altum, pallide viride. Ovarium cum pedicello 5 cm. longum.

New Guinea—flowered by Mr. Alex Grant, of Mackay, N.Q. June, 1940. (Type in The Herbarium, Brisbane.)

It may be redescribed in English as follows:—

Rhizome strong and creeping. Stems robust, erect, elongate, fusiform, yellowish-green in colour, ribbed, about 30 cm. high, and 2-2.5 cm. diameter in the thickest part. In the lower part they are clothed with the sheaths of old leaves which gradually are shed, leaving the lowest internodes naked. Leaves spreading, the base produced into a stem-clasping sheath, lanceolate, shiny above and dark-green, paler beneath, and fleshy-leathery in texture; 12-16 c.m. long, 3-4 cm. broad. Flowers white, about 22 in an elongate raceme, the rachis green, about 40 cm. long. Bracts 7-8 mm. long, linear-lanceolate, apex acute. Dorsal sepal 2 cm. long, 5.5 mm. broad, slightly twisted, undulate, apex acute, the lateral sepals with the base of the gynostemium forming a slightly curved spur, green on the back, linear, undulate, and about 2 cm. long. Petals linear, gradually widened towards the apex, 3.5 cm. long. Labellum 3-lobed, 2.5 cm. long, in the lower part, including the lobes, 1.7 cm. broad. Lateral lobes in the lower part yellowish-green, towards the apex violet coloured, margins entire. Intermediate lobe 1 cm. long, 6 mm. broad, violet coloured, undulate, somewhat oblong in shape. The disc violet coloured, with three longitudinal crests, and all of them abruptly extended at the apex into a small erect plate. Intermediate one higher than the others, and 1.5 mm. high. Column 7 mm. high, pale green. Ovary with the pedical 5 cm. long.

● *Cymbidium grandiflorum* is a shy flowering but superb species which inhabits the districts of Nepal, Sikkim, and Bhutan of Northern India. Its home is situated somewhere near the latitudes of 27 and 28 degrees north, at altitudes between 4900 to 7500 feet. It requires the coolest and shadiest corner in the bush house during summer in New South Wales and Southern Queensland. Copious autumn rains seem to induce it to flower more freely, the flowering season being late winter and early spring.

● Regarding exhibits: Several members have suggested to the Hon. Secretary, Mr. T. H. James, that it would increase the general interest if the exhibits were labelled in a prominent manner, even if the labels were of a temporary nature.

Malformed Flowers

F. A. WEINTHAL, *Roseville, N.S.W.*

● It would be interesting to hear whether other growers have had similar experiences to mine. Some years ago the writer received a plant of *Laelio-cattleya* from England. On the first flowering after establishment here the bloom was of good form and colour. This was repeated the two following years, on one occasion the single bloom being approximately eight inches across. Admittedly this is not exceptional size but is quoted merely for comparison with what follows. For some reason, perhaps deterioration of potting material or unsuitable conditions, the next year's flowers came malformed with some segments missing. Notwithstanding new material, this deformity again appeared the following year. The plant was then reduced to the four or five front pseudo-bulbs, replanted in a smaller pot with fresh material, but the resulting new growth again produced only part of a flower. Last season the growth was larger but the bud which showed its deformity in the sheath was removed before it opened. All the malformed flowers were much smaller than the original perfect ones and did not exceed 4 to 4½ inches in measurement. The plant was then put on its final trial previous to being destroyed if no better flowers eventuated. This season's growth, while no stronger than the previous one, however, produced two well formed buds which opened into good flowers slightly over six (6) inches across.

The case was mentioned several years ago to a visiting representative of an English firm from whom the plant had originally been obtained. While he was quite familiar with plants producing faulty flowers from the beginning, he could not remember nor account for a plant which had borne perfect flowers deteriorating into one that regularly produced defective blooms. It had not then retrieved its reputation by its latest good flowers. The cause may have been bad culture in this case, or there may be some other explanation. Can any of our growers of reasonable experience suggest anything?

A Cultural Calendar

P. A. GILBERT, ***Lakemba, N.S.W.***

September

● September is a real Orchid month. Plants going out of flower and others coming in keep the Orchidist in a whirl of activity. Changeable weather is prevalent, one day being cold and the next hot, requiring constant watchfulness in all matters relating to the growing of Orchids. Discretion will be required with regard to watering, keeping on the cautious side until the settled warm weather gives us the word "go." Very little, if any, heat will be required in the hothouse. Be liberal with bottom ventilation and damping down. Thrips and red spider make their appearances this month, so be on the watch and extirpate these first batches to make the "going" easy for the rest of the season. On no account let them "dig in," because they play havoc with young growths, besides being with you all the summer.

The last of the *Cypripediums* to go out of flower should be potted early this month, and *hirsutissimum* can be dealt with as soon as it finishes blooming. Do not delay this operation, as *Cypripediums* require plenty of growing time to enable them to get on their "legs" to flower satisfactorily the following autumn and winter. *Cymbidiums* also should be potted as they go out of flower, where necessary, putting them into pots two sizes larger when pot-bound. Shake off the loose soil, but do not disturb the root system beyond this. *Dendrobiums* that have flowered can receive potting attention now, but go steady with the water until the new roots become active. *Lycastes* will also need attention, a fresh top dressing of compost being desirable where it is decided not to repot.

Damp down the floor and benches early in the morning and again at mid-day when possible. Shading will need some attention, as September can produce an occasional very hot day that may be ruinous to young growths. Sphagnum moss will begin to grow now, so watch that it does not overgrow the rhizomes of *Dendrobiums* and *Cattleyas*, clipping it back with scissors, or working it away with the fingers.

During this month it will be a very important time for some of the *Cattleya* group, and those that need repotting should be given immediate attention, as soon as they reach the right condition. This is usually when the young roots are pushing out at the base of the leading pseudobulb. On no account allow these new roots to develop any length, as it is well nigh impossible to repot the plant without breaking the growing points off. If the operation is carried out at the correct time the plant will establish itself immediately. The roots of *Cattleyas* are very brittle, so be sure and pot your plants firmly.

October

Atmospheric moisture can be increased with more frequent damping down. On hot days a light overhead watering can be indulged in up till noon, with safety, to give the plants time to dry out before sunset, as October occasionally produces some crisp, cool nights. Many kinds will now be growing actively, as the warmth from the sun will be increasing daily. Take the shading problem a little more seriously than during last month, as a mild heat wave may occur before a possible thunderstorm.

Cattleyas that require it, and those that have flowered in September, should be potted as early as possible. These are more susceptible to disturbance than most varieties of Orchids, hence they require more time to become re-established, so do not delay a day longer than can be avoided.

Have another look about for thrips, as there may not have been any observed during your September examination. The presence of the yellow thrips may be detected by the appearance of brown patches on the foliage of *Cypripediums*. If neglected the pest works its way down into the centres of the plants, where it is almost impossible to dislodge it by fumigation alone. Nicotine sulphate and other remedies advocated in this Review should be resorted to.

The small black thrips, which is not so virulent as the yellow one, attacks *Dendrobiums* and *Miltonias* chiefly, attacking the under side of the leaf. A magnifying glass is useful in identifying this pest, as the earlier stages of its life cycle can go unnoticed until they have done considerable damage. Read Mr. W. A. Smith's articles in this and the previous issue of the A.O. Review. Give plenty of ventilation, as Orchids require abundant pure air while growing.

Do not work *Cymbidiums* overtime by allowing the flower spikes to remain on the plants too long, as it is not in the best interests of the plants, especially if they are small in size. Generally while in flower the new growths are held back, and if prolonged inordinately the plant will probably miss flowering the following season, through lack of time to develop the new pseudo-blubs. The plant will also lose vigour if it is thrown out of its routine under cultivation. Some growers give their *Cymbidiums* full sunlight, but the safest light is slightly checkered sunlight, the plants flowering freely if other kindnesses are bestowed upon them, such as overhead watering and weak liquid manuring.

November

Pot up all the late flowering plants that have finished, especially *Dendrobiums* and *Cattleyas*, as it will be necessary to keep all plants moving for the next five months. Systematic watering, damping down, and shading where required, will find plants responding "with a smile." Examine each plant when convenient to see that none is thirsting for water. A check in growth will become apparent in the flowering season, the flower sheath being late will probably damp off, or turn brown. Orchids flower perfectly when grown to suit their own flowering seasons; any dislocation will result in badly formed flowers, damping off of buds, or new vegetative growths. Cleanliness is most essential at this time of the year, as snails, slugs, slaters, beetles and other pests breed under rubbish. Spray with nicotine sulphate occasionally; even if there is no indication of pests, the moss fly, moths, and other insects which make their appearances now will be kept at bay.

● Mr. D. Symon, 19 Fourth Avenue, St. Peters, South Australia, writes:—

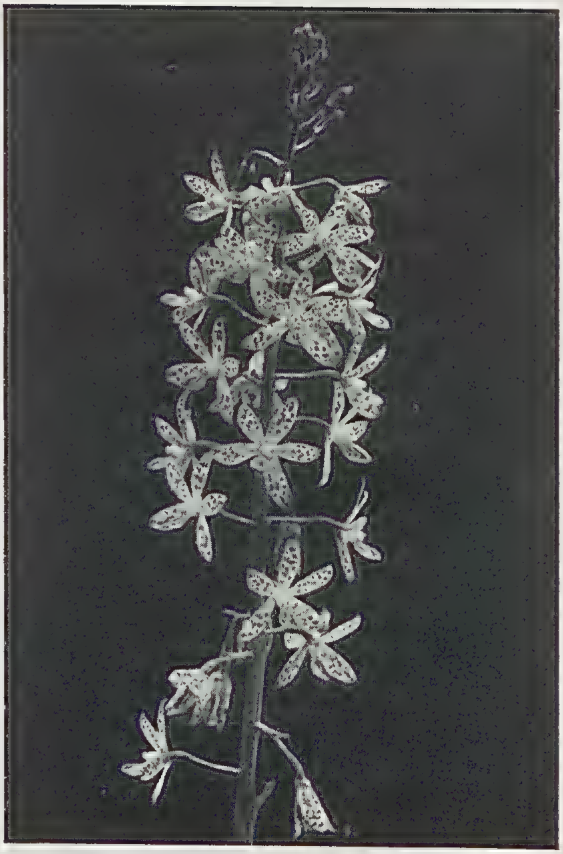
"A year or two ago I received a few Orchids from a dealer in India. Amongst them were two specimens of *Cypripedium Fairrieanum*. They were duly planted and soon threw up flowers (out of season). Two plants (they had been divided) were of a pale variety; the other two were much darker and quite distinct.

"Last year they flowered again and the dark ones produced two flowers on each stem, although they were cut before the second flower opened.

"This year, after growing well, all are flowering again and each plant has two buds on its stem, although they are not out yet. I have not seen any mention of this *Cypripedium* having more than one flower on a stem. Is it usual?

"They are growing in an unheated sunken glasshouse." (June, 1940.)

It is decidedly unusual for this species to carry two flowers on the scape. Hybrids derived from *C. Fairrieanum*, or in which it is a part, sometimes bear two flowers on a scape, notably *streathamense*, and *Thalia*.—Hon. Ed.



DIPODIUM PUNCTATUM, *R. Br.*
"Hyacinth Orchid"
Distribution, all Australian States except Western Australia. November to January main flowering period.
Photo by G. Cruickshank.

● The majority of *Odontoglossums* do not succeed around Sydney, chiefly because of our inability to level up the maximum and minimum temperatures. Most *Odontoglossums* are found from 6000 to 8000 feet above the sea at latitudes somewhere between 5 degrees north and south. Obviously this implies very little fluctuation in the seasonal changes both in temperature and moisture, these being wonderfully uniform throughout the year. The English growers, who are experts in handling these subjects, aim at temperatures of 50 degrees for winter, and 60 for summer. Around Sydney, without artificial heat, the temperature touches 32 degrees in winter, rising to 100 or more in summer.

● *Coelogyne speciosa* belongs to Java and is found between 3000 and 5000 feet above the sea, at about latitude 7 degrees south. It requires intermediate treatment in New South Wales and Queensland.

Some Orchid Pests

A Short Account of their Life Histories and Control

W. A. SMITH, *Brisbane, Q.*

Continued from Vol. 5, No. 2

Sap-Sucking Insects

● Thrips or "fringe-wings" are minute insects that can cause a good deal of damage to ornamental plants as well as to agricultural crops.

The adult is about a sixteenth of an inch long and comparatively narrow. It has four narrow wings fringed with long hairs on the margins and is very active in its movements. Though the wings may be used for flying, flights seldom range more than a few yards. The eggs are laid in the tissue of the host leaf, and after some weeks, the period depending on the time of the year, the first stage nymphs emerge. These young or immature stages of thrips resemble the adult except they have no wings. There is no true larval or pupal stage as in such insects as beetles and moths. The newly hatched thrips have from three to six growth stages, occupying a few weeks, before they attain the adult stage. During one or two of the later stages, the nymphs do not feed. This corresponds to the pupal stage of other insects.

When feeding, the pest pierces or rasps its way into the plant tissue and sucks the juices of the macerated cells. It leaves areas of dead brown surface on the leaves and gradually causes the flowers to wilt and become discoloured by feeding inside them. If only a slight attack of thrips is experienced it may be controlled by simply watering the foliage frequently. Sprays of nicotine sulphate with a strength of a teaspoonful to 1½ pints of water are generally effective in reducing a severe infestation. Two or three sprayings at intervals of seven to fourteen days will be found necessary, since nicotine sulphate does not kill the eggs, and hatching may occur after the first spraying. When spraying the usual precautions should be taken regarding the shading of plants to ensure that no burning of the foliage results.

Scale Insects

Scale insects impair the health of plants when they occur in sufficiently large numbers, by a continuous removal of plant sap. Quite a number of species are present on Orchids, and in Queensland members of the genera *Aspidiotus, Aulacaspis, Mytilaspis, Lecanium,* and several others have been recorded. These types of pests are characterized by having winged males and wingless females. The males are very tiny delicate creatures, which generally occur in spring and autumn, but are rarely seen. The wingless females and pupae of the males are what we observe on the plants.

The female insect of the *Mytilapsis* has a small irregularly shaped body which lies beneath a protective waxy scale which it secretes. This protective scale has to be lifted off to see the insect. The female adult is without legs but is provided with a comparatively long sucking tube or proboscis which it inserts into the tissues of the leaf, stem, or root, and through this it imbibes the plant juices.

Reproduction may be sexual or parthenogenetic, i.e., without fertilization of the eggs taking place, and generally these conditions occur alternately. The eggs are produced in large numbers under the covering scale. In the spring the dormant eggs hatch, and the very small, yellow, six-legged crawlers emerge. They wander over the surface of the plant, or may be blown short distances, and after a short time settle down to a stationary existence, providing themselves with a protective scale. After two or three moults the adult status is attained, and they set about repeating the cycle. The males also have a scale-like protection and feed in the same way as the female up to the stage when they emerge as winged adults. The number of generations during the summer varies with the species, but generally there are three or four. In common with many other insects, there is very little activity during winter.

Other types of scale insects vary from the one just described in having no protective scales, and in possessing legs in the adult female stages. Further, among the types protected by scales, there are some species in which the eggs remain within the body of the female, which dies before the eggs hatch.

Mealybugs are larger than the common scale insects. They are soft bodied insects commonly covered with mealy threads of wax which prove of some value as protection. All stages possess legs but when mature are not particularly active though still capable of movement. The life history is similar to that of the common scales but is often shortened so as to crowd more generations into the summer months. Mealybugs have a nasty habit of clustering in inaccessible leaf axils, although they are also found on the roots and leaves. Long distance transport of both mealybugs and aphids is effected by ants. In return for the services rendered the ants feed upon the sugary liquid, known as "honey-dew," secreted by the mealybugs, aphids, and common scale insects. This honey-dew also spreads over the surface of the foliage and provides a medium for the growth of a black fungus known as "sooty mould," which is harmful only from the aspect of excluding light. This prevents the proper function of the leaves of forming sugars and starches. Control of the insect removes this trouble by eliminating the food supply of the fungus.

The method of controlling these various scale insects on Orchids has to be considered in conjunction with the type of Orchid, as well as the method of growing it. Where a white oil emulsion can be applied without injury, it may be sprayed on the foliage, but since the oil would clog the root pores, it must be kept from them. This is done by inverting the potted plant, carrying out the spraying, and then leaving it in this position until the excess spray has drained off. If the Orchid is permanently attached to a tree some other means of protecting the roots has to be devised. White oil gives the best results when the tiny yellow crawlers can be seen in greatest numbers. This application should be followed by another about one week later to kill off any further nymphs in the same generation which may have escaped the previous treatment.

Many Orchid growers prefer to destroy colonies of scales by simply wiping or brushing them from the leaf with an old toothbrush, sometimes aided by a little warm soapy water. This method is useful particularly if the plants are flowering and it is not desired to spray them. Repeating the operation two or three times each year should suffice to keep the pest in check. Fumigation of potted plants with cyanide is always an effective way of killing these and other pests, but there is the possibility that this method will endanger the health of the more delicate plants, particularly if they are moist, and, moreover, a suitable fumigation chamber is not always available. Spraying with nicotine sulphate has been suggested for dealing with mealybugs. Further, overhead watering systems, such as are used by a number of growers, have been found to check their spread.

Ants

A watchful eye should be kept on the ants when mealybug control is attempted, since these insects will attempt to transport any survivors to fresh pastures. While the plants remain in pots in which ants are well established, control measures such as periodic flooding of the pots, have generally been found satisfactory. During repotting operations they should be reduced in numbers if the fresh compost is clean. If the pots are suspended by wires, some device such as is used on a meatsafe could be tried. These should be fitted immediately after transferring the plants to fresh pots.

Aphids

Aphids, which are closely related to scale insects, are common in Queensland. A lone species of the genus *Aleurodaphis*, often mistaken for a scale insect, is the only one of frequent occurrence. Among the aphids, the adult females may be winged or wingless while the adult males are always winged. In *Aleurodaphis* the winged forms are very rare on Orchids. The dark, oval, wingless female is surrounded by a fringe of white wax filaments. It feeds, like the scale insects, by sucking the plant sap through a proboscis. Six stout legs enable aphids to move about in any stage. The young crawlers are pink in colour and quite active. They secrete the white waxy fringes around their bodies at an early age. The complete life cycle may, in summer, occupy only a few weeks. *Aleurodaphis* is another insect which is farmed by ants for the honey-dew which it secretes. The insect is readily controlled by nicotine sulphate used as a spray, and preferably applied when the young stages are evident. Nicotine sulphate is not a spray that commonly burns plants. It is only necessary to see that the strength of dilution is not excessive and that applications are not made in direct sunlight.

Red Spider and Mite

Two more of the sucking type of pests are red spider, which produces a webbing on leaves, and red mite, which is almost the same in size and colour, but has no webbing associated with it. Both mite and spider are usually smaller than a pin's head. The eggs are delicately sculptured when seen under the microscope. They are laid on the leaf surface, or amongst the webbing, and from them the nymphs hatch. The nymph has often only six pairs of legs, and passes through two or three growth stages before becoming an eight-legged adult. Sulphur dust is now widely used in controlling these pests. It does not radically alter the acidity of the compost if only a light dust falls on the surface of the pot. A lime-sulphur spray has also been suggested. With this spray foliage burning would probably result if the plants were not shaded.

Although the Australian Orchid grower has such a large number of pests to contend with, the outside world has many others. Two of these, *Mertilla malayensis,* a Capsid bug from the Netherlands Indies which is an active sap-sucking insect, and the European rose sawfly, which saws off Orchid spikes, have already been recorded from Australia. The increasingly strict Commonwealth quarantine measures in operation, requiring an examination, and often fumigation, or even more extreme treatment of all imported consignments of Orchids are designed as a safeguard to prevent such insects gaining a foothold in this country.

General Control Considerations

The method of control of an insect or allied pest is one which the Orchid grower has often to decide for himself. Each case should be treated on its merits where alternative methods of control are offered. If the number of Orchids is small, then mechanical destruction should not be over-tedious. If the number is large and the pest is well established, then a dust, spray, or bait may be considered. However, if you know through experience that a spray is definitely injurious to your plants, then you may prefer to kill beetles, scale insects, aphids, and the like, by hand. Orchids grown in a glasshouse can best be protected by thoroughly cleaning the glasshouse and then making it insect-proof by the use of a fine mesh gauze over any ventilation holes. These remarks will serve to indicate that there is no one method of control to be recommended for one insect in all circumstances, and that each grower should intelligently modify any basic suggestions to suit his own particular conditions.

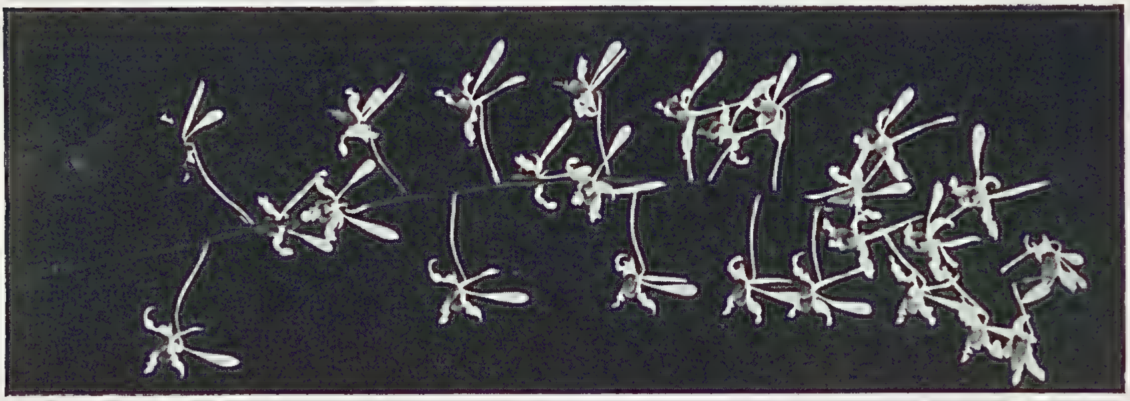
Dendrobium Grantii, *White*

ALEX. GRANT, *Mackay, Q.*

● A plant of *D. Grantii* is growing in a 4-inch pot, in my glass house. The compost is the same that I use for *D. superbiens* and *D. Phalaenopsis,* namely, osmunda fibre with the usual crocks for drainage. I have tried a mixture of osmunda and sphagnum moss and also one of staghorn peat, but have had better results with the osmunda only.

D. Grantii is a vigorous grower, the new growth breaking away at the base of the plant in a manner very similar to *D. Tofftii,* growing rapidly during summer. The plant receives heavy and continuous watering during the entire growing period and is not allowed to become dry at any time.

The flower scape shown in the photograph measures 27 inches in length and the flowers are distributed at intervals varying from 1 to 2 inches for a distance of 22 inches. The scape carries 26 blooms but when the photograph was taken three had been removed and sent to other growers. Flowers are long-lasting and comparable to *D. superbiens* in that they have no fragrance. Individual flowers measure $1\frac{3}{4}$ inches across the petals and $2\frac{1}{4}$ inches along the dorsal sepal and labellum. Petals and sepals are white, the petals being twisted as in *D. undulatum,* upper sepals plain and reversed, lip pale green in the throat, shading out to a pale mauve on the side lobes, white on the point, shaded mauve, the whole of the lip finely veined with light purple, altogether a very pretty flower. This description is as near as I can give without going into minute detail.



DENDROBIUM GRANTII, *White*
A new species described by Mr. C. T. White in this issue
Grown by Alex. Grant, Qld. Photo by Holyoakes, Mackay.

Nostalgia—

The Complaint of a Cattleya

J. MURRAY COX, *Brisbane, Queensland*

I

Torn incontinently from my harbourage
High on a tree which through the centuries
Has raised a noble head midst its primeval brethren—
Thrown, numbed and bruised, in a fuggy box—
Thence in a dark and noisome hold,
Transported o'er the uncertain waves
Until I came at last to rest, fatigued, half-starved and "all-alone,"
'Midst some four hundred and four score
Sad exiled plants—who stood in seried ranks
On benches in a heated house;
Or hung, like felons, from a beam
Athwart the glassy roof.

. . . . . .

And here for five long years I've dwelt.

II.

Our lord and master is a gentle soul
Who loves and tends his slaves with learned care—
Whose greatest joy it is to find
Buds on a plant that ne'er has bloomed before—
Whose love is catholic, nor scorns the meanest flower
Which graces for a whole the confines of his bower.
Each plant is scanned with careful eye
Lest pest or pestilence assail;
Or lest as peradventure may behap
The unwonted routine of the gaol
May cause its soul to flag or strength to fail.

III

In durance there's a regimen that numbs
The lifespring of the captive—be he man or animal or plant:
Though 'tis designed, by minds that do not understand
To keep together tortured frame and soul
Which, for their eternal peace, fain would be separate.

IV

In such a case live we, sad captive plants that erstwhile lived afree—
'Tis all meant for the best. In wise way 'tis decreed
That we shall have such warmth at noon, and such at midnight's hour;
The living sun no longer is the arbiter but some cold thermostat
That works upon a formula of Fahrenheit or Centigrade.

V

The very water that we crave is measured out
In rigid fractions of an inch—
So much at five, so much at twelve
And then again at three—if so permits
Barometer, hygrometer or such.

VI

Our food is rationed in accord with scientific lore—
So much of nitrogen and this—
So much of that and of those other things
Essential to the nutriment of plants:—
Potash, lime and humus, and all the various vitamins
Pale sickly chemists have devised
To kill romance in appetites of man and plant.
The very light we need to stir our organs into action
Is regulated nicely, with paint and blind and screen.
They fear the kindly sun will burn us—
We who have lived for centuries
In strait communion with the Lord of Light!

VII

Our lord and master, kindly soul, oft frets
To find that I, who seem to grow in native vigour
Yet show no sign of sheath or spike—
He's done, he feels, the whole appointed catalogue of things
That make an orchid blossom!
But how *can* I, pent prisoner in a humid cell
Deprived of sun and breeze and all the high adventure
That Mother Nature wills shall be
The inspiration and the goad to my fruition?
Can the wild bird, enclosed in an iron cage
Pour out its full sweet ecstasy of song?
Can the raped beauty torn unwilling from her father's home
To be just one more houri in a jaded sultan's bed
Give to her aged diseased lord, the gift of Love?
Or can the glittering streamlet, rushing down the glade,
Ripple and sing when some dull farmer's oaf
Has thrown a dam of mud and branch across her course?

VIII

Up on Parima's heights there is a tree
That stands Titanic 'midst its brother giants.
Its high branched stem is clothed
With firm and fibrous bark
That gives fit anchorage for orchid roots.
'Twas here some century or more agone
I first saw light. Perchance some vagrant wind
Tossed on the living tree a tiny seed
Or else some errant bird or climbing beast
Or yet perchance an ant or some such humble thing
Left with that forest host, the germ
That brought me into being.
Howe'er it may be, on that tree I grew
And flowered and shed about
The seeds that presaged further life
To carry on my work of adding beauty to a sombre world.

IX

Close by, the Orinoco's stream raced through its tortile banks
From the high hills down to Paria where lies the isle of Trinidad
And romantic Port-O-Spain.
About me and below there lay the leafy gloom
Of forest primeval; from whose shady fastnesses
Rose the mixed scent of flowers and stench of foetid tropic.
The quiet of the night was broken oft
By the snarl of spotted jaguar or the cry
Of some blood-hungry puma on the trail
Of his predestined prey.
And sometimes through the sleepy night would come
The dulcet song of some lone Indian on his way
In bark canoe to secret trysting place—
Or else the shrill screetch of warriors
Casting defiance to the foes who lurked with poised dart
Amidst the shrubs that limned the river bank.

X

And with the dawn, the sun, all glorious, shed
Its virile fructifying beams about—
And brought to wakefulness the forest folk.
Then was the air with fragrance filled—

A thousand different scents from twenty thousand flowers.
The bees and beetles in their swarms
Fulfilled their part in Nature's wondrous plan,
While humming birds in glowing colours clad
Hovered and sped about me and around;
And when the mild and balmy trades brought on their breath
A passing thunder-shower, took shelter 'neath my leaves and flowers.
Beneath the haven of my roots and stems
Their dwelt a tribe of ants, fierce warriors
(Not like these stingless stinking things
That climb about me here and spread
Aphis and scale and filth around)
But gallant soldiers who, in thanks for harbourage
Sallied in angry force 'gainst any foe
Who might approach to do me injury.

XI

Such was my home—thus Nature willed that I should live—
Not in a glassy sepulchre that shutters out
The sunlight and the wind and rain;
Not in a grimly regulated cell
Where every breath and every sup
Is measured by the rule of some abstruse machine.

XII

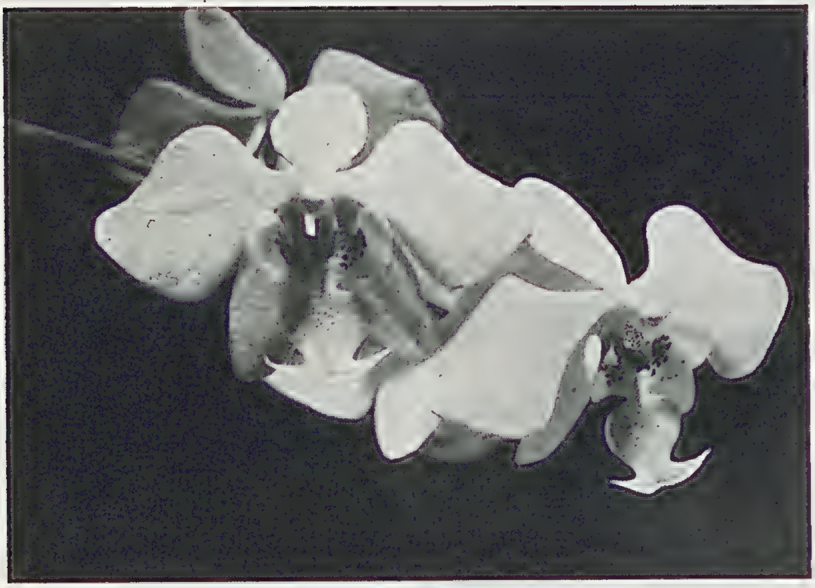
I may not die—the routine of the gaol
Can warp the spirit and yet build the frame—
But all their care and all their erudition
Can never in my being strike the spark
That lights the flame of fierce desire
To urge me to my life's fruition.

XIII

Give me the sunlight and the breeze,
The tickling of the wind about my leaves,
The soothing patter of the rain that comes
By Nature's bounty to revive the thirsty earth.
Give me the life that every living thing is heir to
The right to strive and struggle—to succeed or die!

XIV

Give me just these and in return
In humble gratitude and joyous love
I'll bear for thee such flowers
As you in your most secret heart
Have never dared to hope for—
Such beauty and such fragrance as shall make
Your heart stand still a beat—and bate your breath—
Like unto one who stands within a Holy Place
And sees transfigured Truth—
And knows at last that God is Beauty
And Beauty—Love transmuted.



PHALAENOPSIS SCHILLERIANA *Rchb. f.*
var. vestalis.
The white-flowered form of the species.
Grown and photographed by F. Th. J. Nyland, Java.

- Mr. C. Cambourn, of North Sydney, grows *Dendrobium Phalaenopsis* under clear glass against a northern wall. During the growing season he gives it copious overhead waterings of the foliage, but not particularly the compost, and no watering whatever during the resitng period.

- Several recent *Cypripedium* hybrids were shown at the May meeting in Sydney. One worth acquiring was *C. Cheddington,* shown by Mr. D. Adamson, another exhibited by Mr. E. Usher being *C. Minatour x A. K. Berry.*

- *Cryptochilus sanguineus* is a rather quaint species with brilliantly coloured red flowers. It is not exactly a horticultural kind, but its novelty earns it a place in collections. It requires the treatment accorded some of the Himalayan *Dendrobes,* coming from Sikkim and Nepal at about 5000 feet above sea level.

- *Vanda Kimballiana* is an inhabitant of the Shan States, Burma, thriving at an altitude of about 4000 feet, in latitude 22 degrees north. It is a lover of cool surroundings, and should be given the coolest position in the bush house during summer in New South Wales and Southern Queensland.

The Eucaladenias of New South Wales

Rev. H. M. R. RUPP, *Northbridge, N.S.W.*

● *Eucaladenia* is a section of the terrestrial Orchid genus *Caladenia,* in which the sepals and petals are never prolonged into filaments as in the section *Calonema* ("Spider Orchids"), but are merely acute. The calli or glands of the labellum, excepting a few at the extreme base, are short, and the labellum itself, though rarely entire, is not very conspicuously fringed.

Of 22 species of *Caladenia* now recorded in New South Wales, 13 belong to *Eucaladenia.*

These are:

C. alba R. Br.
C. carnea R. Br.
C. alpina Rog.
C. angustata Ldl.
C. testacea R. Br.
C. cucullata Fitzg.
C. iridescens Rog.
C. dimorpha Fitzg.
C. caerulea R. Br.
C. congesta R. Br.
C. tutelata Rog.
C. deformis R. Br.
C. latifolia R. Br.

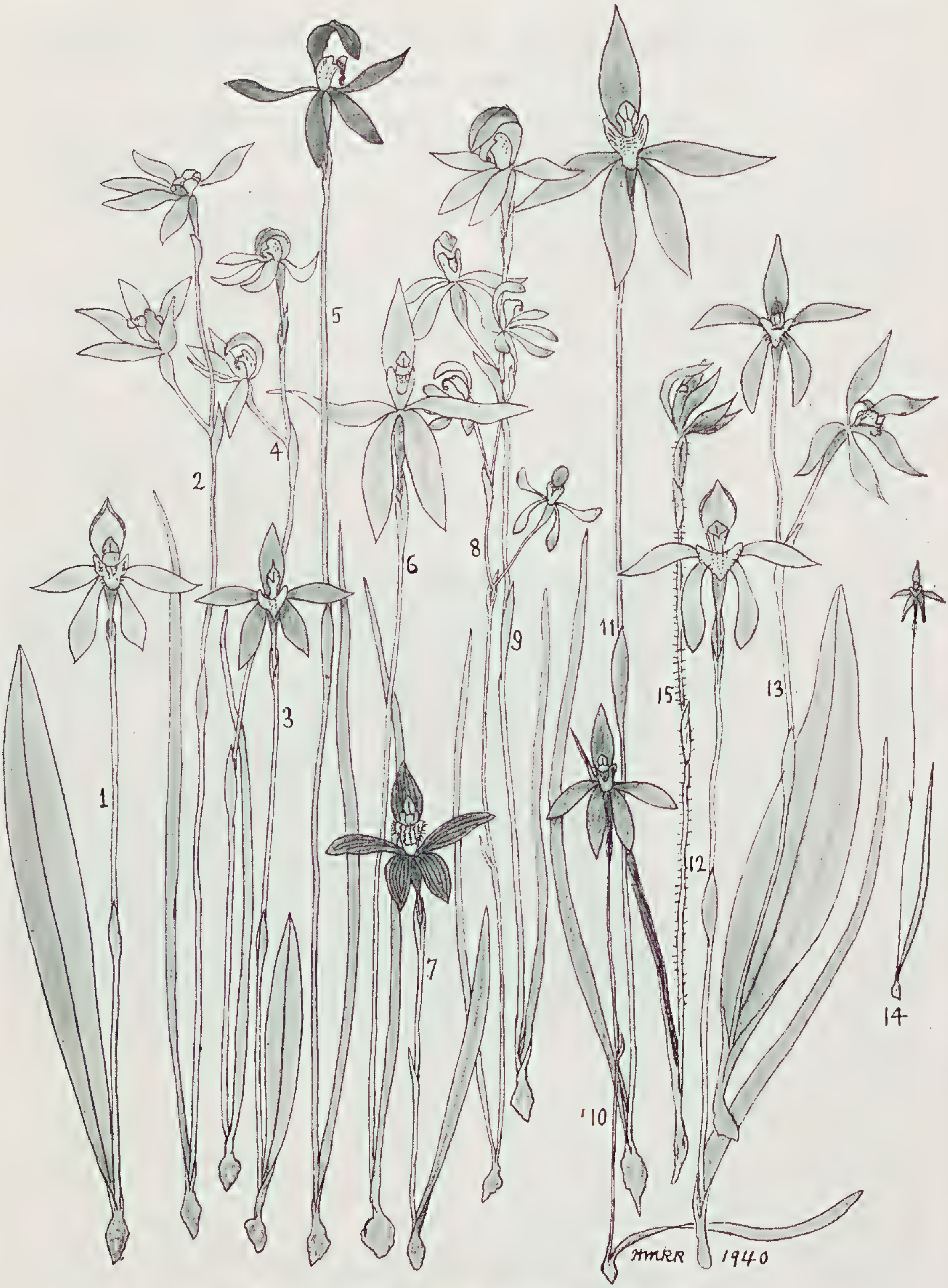
I include the last-named, *C. latifolia,* because it is given as a New South Wales species in Moore & Betche's "Handbook of the Flora of New South Wales," and is included in Maiden and Betche's *Census* (1916). No New South Wales specimen is possessed by the National Herbarium, nor can I discover anyone who has seen it in this State; I have searched for it myself in likely localities for quite 25 years without success.

1. *C. alba.* Bentham could see no difference except that of colour between this and *C. carnea.* Undoubtedly they are closely allied. and the fact that *C. alba* is sometimes pink while *C. carnea* is sometimes white, has increased the confusion between them. Nevertheless I, for one, am prepared to maintain that Robert Brown was quite right in keeping them apart. Wide experience of both species over many years has led me to formulate a rule which may, or may not, be endorsed by other observers, but which I find thoroughly satisfactory. I do not include in *C. alba* any form exhibiting transverse red bars across the labellum and (or) column. This is a characteristic and (in my view) constant feature of *C. carnea;* and any forms with these markings which otherwise seem to approach *C. alba* I prefer to regard as natural hybrids. (It can scarcely be doubted by anyone familiar with both in the field that they do hybridize.) On the other hand, I cannot accept as *C. carnea* any form entirely lacking in these markings. Our veteran leader in Australian Orchidology, Dr. R. S. Rogers, has named and described a small form quite devoid of transverse bars as *C. carnea* var. *aurantiaca.* I have not seen any certified specimens of this; but on the shores of the Myall Lakes in this State there is a small form which agrees pretty closely with its description, but which has always appeared to me to be in every essential a diminutive *C. alba.*

The typical *C. alba,* which is very common in many parts of New South Wales from the Dividing Range to the coast, is a slender plant from 3 to as much as 12 inches high, with a single narrow basal leaf usually more than half as long as the stem. The flower is generally solitary, but there may be 2 or 3, or rarely 4. In large specimens it may exceed 2 inches from tip to tip of the segments, but the average diameter is perhaps an inch. The colour is pure white except for the yellow-headed calli along the labellum and its yellow or orange tip; also the column is often pale green rather than white.

Variants from the type are coloured pale pink or even rose, the lateral lobes of the labellum often being stained deep rose or purple. Beautiful variants of this kind are common in September on the South Maitland Coalfields. The flowering season of *C. alba* is erratic and extensive. It may appear as early as April; and flowers may be found all through the winter and early spring. They rarely survive September, except in cool localities. *C. carnea* makes its debut in August and may be seen long after its white relative has gone.

2. *C. carnea.* This is the commonest, the most widely-distributed, and the most variable, of all the *Eucaladenias.* It is reported from all the States; I have not seen the Western Australian form. In my opinion two New Zealand *Caladenias, C. minor* Hook. and *C. exigua* Cheesem., should be included in *C. carnea.* Except in the acuteness of the perianth-segments, I can see no difference of importance between Hooker's species and Dr. Rogers' *C. carnea* var. *pygmaea;* and *C. exigua* seems to be merely a smaller form with a single marginal callus on either side of the mid-lobe of the labellum. I have in my herbarium a specimen from Longley, Tas., and two from the Hawkesbury River in this State, which are indistinguishable from *C. minor,* and which Mrs. C. A. Messmer considers identical with specimens of *C. carnea* v.



THE EU-CALADENIAS OF NEW SOUTH WALES.

pygmaea collected by Mrs. G. E. Perrin and herself at Pawranna in Tasmania.

The "Pinkies" beloved of children are so familiar to most of us that it seems unnecessary to take up much space in discussing the typical form of *C. carnea.* Light pink is the dominant colour, but darker shades are quite common, and sometimes the perianth is white. The plant is similar to *C. alba;* the flowers, numbering from 1 to as many as 6, are scarcely as large. The labellum is prominently 3-lobed, and both it and the column are more or less heavily barred with red lines. The calli along the labellum are light- or dark-stalked with yellow heads, and the tip of the labellum is yellow.

The principal variant is Dr. Rogers' var. *gigantea.* It is not always literally "gigantic"; but at its best it rivals a large *Glossodia major* in size; in fact, the first time I saw it, for the moment I thought I had discovered a new rose-coloured *Glossodia.* The colour is bright rose-pink, and there is a strong musky perfume like that of *C. angustata.* This is present sometimes in the type form, but the latter is often honey-scented, and sometimes scentless. (*C. alba* is never perfumed.) The labellum of var. *gigantea* is broader than that of the type.

In striking contrast are the diminutive forms of which var. *pygmaea* is the representative. It is difficult to realise that we are dealing with one species when these and var. *gigantea* are placed together, but the essential features of the floral structure are identical; and intermediate forms are numerous. One such form, which is exceptionally attractive, occurs on and about the Darling Downs in South Queensland. It has almost the colour of var. *gigantea,* but the plant is exceedingly slender, and the flower is not large. For this I have proposed the varietal name *gracillima.*

In the National Herbarium at Sydney is another form, collected at Kurnell, Botany Bay, which I think merits varietal distinction. It is not much larger than var. *pygmaea,* but differs from that in its very acuminate perianth-segments, and in the vivid colouring of the labellum, noticeable even in dried specimens. The tip is almost bronze, and the calli are orange. The bars across the labellum and column are brilliant red.

3. ***C. alpina.*** Dr. R. S. Rogers named and described this species in *Trans. Roy. Soc. S. Austr. LI,* 1927. At the close of his description he gives the N.S.W. locality, "Mount Kosciusko, Mr. G. V. Scammell, January, 1924." In the National Herbarium there are specimens collected near Queanbeyan in 1900 by the late R. H. Cambage, which undoubtedly belong to this species. In this State it appears to be confined to our southern highlands. In Victoria its range extends from the Grampians in the west to the Alps in the east. It is not uncommon in Tasmania. It is a robust plant, not very tall, with a broad leaf and white or pale pink flowers. The dorsal sepal is cucullate over the column, and the perianth is dark-hairy outside. The labellum has transverse bars for half its length. Its calli are rather remarkable; there are 2 thick yellow ones at the base, then 6 rows of yellow ones which are clubbed, followed by 4 rows of yellow ones not clubbed, and towards the apex 4 rows of little white ones.

4. ***C. angustata.*** This species was not actually on record in New South Wales until 1931, when it was found by the Rev. E. Norman McKie on the New England tableland. Since then it has been recognised at Bowral and other places. In Victoria and South Australia for many years it passed as *C. testacea.* The writer urged reconsideration upon southern botanists, being convinced (1) that we had Brown's *testacea* in N.S.W. and (2) that the Victorian and South Australian *testacea* was really Lindley's *angustata.* It was recognised as such in Tasmania. At last Mr. W. H. Nicholls obtained a drawing of Lindley's type from his Herbarium in the British Museum; and the matter was settled. *C. angustata* is a slender plant from 6 to 16 inches high. Flowers 1 to 6, with a strong musky perfume. The floral segments are much broader than in *C. testacea.* Externally they are covered with brown glandular hairs; inside the colour ranges from white or cream to pink. The dorsal sepal is very cucullate over the column. The species occurs in Victoria and Tasmania, where it is very common, and in South Australia; it will probably be yet discovered in South Queensland. The type is Tasmanian.

5. ***C. testacea.*** When the Victorian-South

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1. C. alpina *Rogers.*
2. C. carnea *R. Br.,* type form.
3. C. tutelata *Rogers.*
4. C. cucullata *Fitzg.*
5. C. congesta *R. Br.*
6. C. alba *R. Br.*
7. C. deformis *R. Br.*
8. C. testacea *R. Br.*
9. C. angustata *Lindl.*
10. C. caerulea *R. Br.*
11. C. carnea *R. Br.* var. gigantea *Rogers.*
12. C. dimorpha *Fitzg.*
13. C. latifolia *R. Br.*
14. C. carnea *R. Br.,* a diminutive variety (pygmaea).
15. C. iridescens *Rogers.*

Australian C. *testacea* was found to be Lindley's C. *angustata,* it was supposed that Brown's species was endemic in New South Wales; but it has been collected in Victoria. It is also recorded as a Tasmanian plant; but I am convinced that this is an error. The Tasmanian plant, which I frequently collected myself in the neighbourhood of Hobart, is irreconcilable with the New South Wales C. *testacea,* and agrees very well with Fitzgerald's C. *cucullata.* Personally I believe it to be Robert Brown's C. *gracilis,* a Tasmanian form which Bentham suppressed; and some years ago I endeavoured to procure particulars of *gracilis* from the British Museum. But although I wrote several times, and although the Kew Gardens authorities and a friend visiting London made inquiries on my behalf, no answer from the Museum ever reached me, and I have been unable to settle the point.

Mr. W. H. Nicholls, I understand, has expressed the opinion that two of his own Victorian species (C. *Hildae* Pescott & Nich. and C. *praecox* Nich.) must be regarded as varieties of C. *testacea* R. Br. I have never seen the former; but C. *praecox* I collecetd in Tasmania, and have received many living specimens from Victoria. It appears to me a perfectly valid species; and in this opinion I am supported by Mrs. C. A. Messmer. It is significant that in New South Wales, where C. *testacea* is very abundant in many localities, it nowhere exhibits the slightest tendency to vary from the type at all, being almost unique in this respect.

It is an extremely slender plant from 4 to 9 inches high, with a narrow-linear leaf. Flowers very attenuated, 1 to 6, with a sweet, honey-like perfume. Dorsal sepal cucullate; all sepals and the paired petals uniformly very pale-green inside; but brown at the tips, and covered with short brown glandular hairs externally. Labellum whitish, its margins smooth near the base, then ciliate, then dentate to the tip, which is purple. Calli in 2 close-set double rows. Column striped.

6. C. *cucullata.* I have already alluded to my belief that the Tasmanian so-called *testacea* is identical with this species. It is also found in Victoria. In New South Wales it is chiefly a denizen of hilly country away from the coast, in the southern half of the State. A slender plant up to 8 inches high; flowers 2 to 6, white inside with occasional suffusions of greenish- or greyish-brown, and glandular-brown or grey outside. Dorsal sepal very cucullate. Labellum-margins entire to the recurving of the tip, where they are bluntly dentate. Tip purple, sides spotted. Calli *hairy,* in 4 rows. Column spotted.

7. C. *iridescens.* In the National Herbarium at Sydney is a single specimen of a *Caladenia* collected near Yass by the late Bishop Dwyer of Wagga. It was placed with C. *Carnea* R. Br., but Mrs. C. A. Messmer agrees with me that it is identical with Dr. Rogers' rare Victorian species. It corresponds exactly with a specimen in my own herbarium from the Grampians, where C. *iridescens* was discovered by Mr. E. E. Pescott in 1913. The following extract from Dr. Rogers' description in *Trans. Roy. Soc. S.A.* xliv., 1920: "Flowers usually solitary, rarely 2, a dusky-red mingled with iridescent golden tints, rather more than 2 cm. in diameter; ovary hairy, narrow, elongated, on a slender pedicel 7-10 mm. long." The height of the flowering-stem is given as 10-20 cm. The colouring of this flower is unique among our *Caladenias;* and any readers of the "Review" who have access to our more elevated bushlands in the south should watch the small *Caladenias,* as it is most desirable that the Yass record should be supplemented by others.

8. C. *dimorpha.* Up to the present, this species has not been found outside New South Wales. Fitzgerald (Austr. Orch. I. 1) gives us beautiful impressions of both forms. Mr. Nicholls thinks that they are less distinct than Fitzgerald suggests; and I agree. The larger form at its best is a very attractive flower. It is not uncommon on the Blue Mountains, especially the western side. Flowers 1 to 3; labellum not lobed, margins with clavate fringes. Column and tip of labellum yellow or purple. Calli in 4 rows. General colouring of flower white, almost suggesting C. *alba;* but the perianth-segments, especially the dorsal sepal, are more concave on the inner side.

9. C. *caerulea.* This small but very beautiful species is very common in many parts of New South Wales, flowering chiefly in August. It is rare in Victoria, and one or two records in Tasmania are doubtful (Rodway). In certain parts of the South Maitland Coalfields I have seen the ground literally covered with these lovely little blue gems. The wiry stem is usually from two to four inches high, the single broad-linear leaf at the base being more or less prostrate. Flower nearly always solitary (the only plant I have seen with 2 is in my herbarium), almost sky-blue; but the labellum is a wonderful blend of blue, red, and golden-yellow; viewed under a magnifier it is the most ornate in the genus. "Albino" flowers have been found, but rarely. In my herbarium is a specimen which has 3 perfect labella, the paired petals being developed exactly as the middle one. The species extends to South Queensland. It is most abundant from the Dividing Range to the coast, but occurs also on the Western Slopes.

10. *C. congesta.* I have never personally collected this in New South Wales, but there are specimens from the Western Slopes (in the southern half of the State) in the National Herbarium. It is not uncommon in the southern States. It is a relatively tall plant, with 1 to 3 flowers of medium size, distinguished by their bright pink colour, and a "congestion" of very numerous dark calli on the mid-lobe of the labellum. Behind these two rows of dark crimson calli run back to the base. The dorsal sepal is very cucullate.

11. *C. tutelata.* probably the rarest of all the *Eucaladenias*. It was first discovered in South Australia, where it was named and described by Dr. Rogers. The name ("guarded") is in allusion to the 4 tall "sentinel" calli at the extreme base of the labellum. Later a few specimens were found in Victoria. In September, 1923, in a large colony of fine *Glossodia major* on the slopes of the Alum Mountain at Bullahdelah, I noticed two smaller flowers which I thought "looked different." I took them to be hybrids between the *Glossodia* and some species of *Caladenia*. Upon sending one to Dr. Rogers for inspection, however, I was delighted to find that he pronounced it to be *C. tutelata*. No further specimens have yet been discovered in this State. The leaf, the colour, and the general form of the perianth, are all suggestive of a *Glossodia;* but the labellum is clearly that of a *Caladenia*, with irregular rows of calli (purple or white with white or yellow heads) in front of the 4 sentinels.

12. *C. deformis.* Brown's name, which is hardly deserved by this pretty little species, evidently alludes to the dwarf growth of the plant relatively to the size of the flower; this dwarf habit is sometimes broken. *C. deformis* occurs in all States except Queensland, but in New South Wales it appears to be confined to the southern half. The only locality where I have personally collected it in this State is Molong, on the central-western slopes. The typical flower is violet-blue. The labellum is closely appressed to the column, and the slender calli are in 4 to 6 rows.

13. *C. latifolia.* I have already expressed some doubt about the presence of this species in New South Wales. If it does occur, it is probably confined to the extreme South Coast (Moore and Betche simply say "Cape Howe"). Bailey includes it as a Queensland species in his "Queensland Flora," but gives no definite localities, and no specimens are known. It is easily recognised by its large, broadly lanceolate leaf, and plants are rarely solitary. The flowers (1 to 4) are typically light pink, but are not infrequently darker; the segments are usually very acute. It should be looked for in sandy scrubs close to the seaside.

Bentham and Mueller included in the *Eucaladenias* a well-known Orchid of the eastern States under the name *C. suaveolens*. G. Reichenbach had put this into *Caladenia;* but Brown had described it originally as *Lyperanthus suaveolens*, and it is much better left where he placed it. It cannot well be put into *Caladenia* without including also all the other species of *Lyperanthus* except perhaps *L. ellipticus*, and there are good reasons against this.

● An exhibit of particular beauty and interest was staged by Mr. Lewis G. Cohen, of Darling Point, at the June Meeting. Mr. Cohen is not a member of the Orchid Society of N.S.W., but, during a recent visit to his home, he offered to send a number of his *Cypripediums* to our forthcoming Meeting. This offer I gladly accepted. The display was the finest of that genus ever seen at our Meetings. The luxuriant growth of these plants is really amazing and has been obtained in a very short time. In fact, many members believed that my remarks at various times about Mr. Cohen's *Cypripediums* were exaggerated until this Meeting. These plants are grown entirely in tan bark. Mr. Lang, who tends these plants, claims that tan bark never goes sour, no matter how much it is watered. The principal factor in growing *Cypripediums* in this medium is copious watering. Even in winter they are watered several times each week.—Extract from Hon. Secretary's monthly report for July.

● The following motion was carried unanimously at the June meeting: "That members of the Queensland Orchid Society engaged on active service abroad in any branch of His Majesty's forces, shall be exempt from membership subscriptions for the period of the War, and be retained in full membership."—Q.O.S. Monthly Report, July, 1940.

Lost Flowers

W. PALMER, *Drummoyne, N.S.W.*

● Many text books explain how to cultivate Orchid plants, but I cannot remember reading in one of them a reason or cure for the above tender subject. This is a topic that has been brought up amongst members at different meetings of Orchid lovers, and, as I have, during my ramblings, met many growers who have suffered, I am setting forth the cause and in some cases, cure of this annoying trouble experienced by them and myself. Generally speakin, there are five main causes of lost buds and flowers, namely, moisture, sudden change of temperature, loss of root action, disease, and insects. The first two of these are closely related. In many collections watering is done by hosing and with sprinklers, which, when completed, often leaves water lodged in the sheath or axil of the leaves. With *Cattleyas* the minute drops of water enter the sheaths and the young green buds are actually frozen to a brown jelly instead of flowering. Three members of our Society have had this happen recently, the buds being visible in the sheath and remaining at that stage for a considerable time until the growers opened them and found the buds browned and dead. With *Cypripediums* the same effect takes place, the moisture turning the bud black and often rotting the scape after the bud has reached a fair height. In vandaceous plants the water lodges in the axils of the leaves, turning the buds brown, as it did to a *Vanda coerulea* and *V. tricolor* this season, to my sorrow. A year's work for nothing!

Sudden change in the temperature is another cause of trouble. Where growers have a command over heating, this can generally be overcome, but many growers have cool glass houses and to them this is an ever-present danger during the late autumn and early spring flowering season. Only last season our President had the loss of some fine *Cattleya* blooms due to a cool southerly change and a damp house. In an unheated house it is preferable that plants be kept on the dry side, for, as the text books say, there is less danger of loss to a dry plant in a dry house. A sudden drop in temperature will often cause condensation in a wet glass house and drops of moisture from the roof will lodge on your plants during your absence and the damage is done, quite unknown to the grower. As a prevention to these dangers, gather the plants in bud together in their families and place several thicknesses of newspaper over them—preferably at night, to prevent the entry of water of any kind.

The loss of roots is rather a puzzle to new growers. I saw a *Cypripedium insigne* in Victoria recently, a fine green plant but no sign of flowers. On turning the plant out of its pot I found very few roots, and this, in my opinion, was the cause of the lack of flowers. As older growers are aware, an Orchid will remain green for a long period without roots but will not flower. Of course, there is only one cure. Repot the plant and keep it fairly dry till root action commences. If new growers find that after a reasonable time their plants do not flower, this is probably the cause. Disease and insects cause a great loss of flowers, so keep your house and plants clean. By adopting these simple precautions, your losses will be reduced and more flowers will gladden the grower's heart and eyes, for, after all, flowers are what many of us grow Orchids for.

● The monthly meeting of the Orchid Society of New South Wales, held on Thursday evening, May 30, was devoted to a sale of *Cattleyas* donated by Dr. C. Hall, comprised of established plants and back-cuts, which realised £23/7/6. The donation was a particularly generous one. Mr. P. A. Gilbert also gave 5 plants of *Dendrobium moschatum*, which were sold for £1/4/-. The proceeds of the sale were handed to the Headquarters Branch of the Red Cross Society. The liberal response of the bidders, and the facile "wielding of the hammer" by Mr. G. Hermon Slade, aided materially in creating the large sum.

● The sale of the Orchids donated by Mr. J. Bisset realised £3/14/6, and the *Cattleya* by Mr. C. T. Gosper realised £1. The total amount, £4/14/6, has been paid to the Headquarters Branch of The Red Cross Society. (June Meeting of the Orchid Society of N.S.W.)

Subscription

● At the June Meeting of the O.S. of N.S.W. the Hon. Secretary advised that a large number of members were in arrears with their subscriptions for 1939-40 and urged early adjustment.

A History of Australian Orchids

C. T. WHITE, *Government Botanist, Queensland*

● The known Orchids of Australia number approximately 450 species or distinct kinds. Each of these had to be collected and subsequently named by a botanist. In the early days of natural history, most naturalists took a very broad view of their science, and had some knowledge of, and might write about such diverse subjects as geology, plants, insects, reptiles, fish or birds. As our knowledge of the different groups increased, it became next to impossible for students to keep abreast of all subjects, so they became more confined in their studies, becoming geologists, botanists, entomologists, ornithologists, and so on. In a like manner, the early botanists were very general in their studies, but as the science progressed and the literature became difficult to cope with, they specialised in different branches—systematics, physiology, pathology, anatomy, and so forth. Systematic botany is that branch of the science which deals with the naming, describing, and arranging of plants into groups according to the natural affinities.

In the early days of the science, practically every botanist's activities were devoted to it. This was only natural, as it is obvious that owing to the very large number of plants known to inhabit the globe—somewhere about 150,000 flowering plants having been described, and possibly a greater number of cryptogamic ones—it is necessary to have, as far as possible, some uniform system of naming and classifying these multitudinous forms.

One of the most natural families of plants based on their structure is the *Orchidaceae* or Orchid family. They are commonly associated with hot, humid, tropical regions, but members of this family are not confined to the tropics and sub-tropics of the world, and are moderately common in England, Continental Europe, and the temperate parts of southern Asia. The Orchids of the British Isles number approximately 40 distinct species of kinds, and in France, which is hotter, and with a more diverse climate, the number of orchid species goes up to 75 or 80.

The family is a huge one, and contains more kinds than any other family of flowering plants. The number of distinct Orchids is about 20,000. The greatest number is found in hot humid countries, such as New Guinea, Burma, Sumatra, Malay States, and the Amazon region of Central America.

After the name of an Orchid is often appended the botanist's name in abbreviated form; thus *Dendrobium speciosum Sm.* means that this, perhaps our commonest Dendrobe, was first named as above by the English botanist, Sir James E. Smith. Very frequently seen in modern works is the following form of abbreviation of author's names: *Galeola cassythoides* (A. Cunn.) Reichenb. f. This means that the specific name cassythoides was the first given to the plant, but in another genus (in this case *Dendrobium*, being named by Allan Cunningham as *Dendrobium cassythoides*) and afterwards transferred to the genus *Galeola* by Heinrich Gustav Reichenbach, the son of Heinrich Gottlieb Ludwig Reichenbach. The "f" in this case stands for "filius," or son, both Reichenbachs being botanists of note.

(To be continued)

The Orchid Society of New South Wales Annual Show

● The Orchid Society of New South Wales will hold its Annual Orchid Show on Wednesday, Thursday, and Friday, 11th, 12th, and 13th September on the Sixth Floor of David Jones' George Street premises.

It was at first intended to abandon the Show this year on account of War conditions, but later, as the result of representations from various quarters, it was decided to hold the Show as usual and devote the proceeds to The Lord Mayor's Fund (Younger Set), and also to one of the public charities whose revenues have been seriously depleted owing to the diversion of much public funds to various War efforts.

The particular public charity which will be assisted is the Food for Babies' Fund.

To this show also, Mr. Robert Dickson, of Castle Hill, will send a number of large specimen tubs of Cymbidiums which will be offered for sale during the Show, or sold by auction at the end of the Show in aid of the Women's Hospital, Crown Street, and the Home for Incurables.

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The dates of the next meetings of the Society are as follow:—

SEPTEMBER, THURSDAY, 26th OCTOBER, THURSDAY, 31st
NOVEMBER, THURSDAY, 28th
at Room 507, Phillip House, Phillip Street, Sydney

Please address all communications regarding the Society to the Hon. Secretary.

Subscriptions for Membership should be forwarded to the Hon. Treasurer. MSS, photographs, and other editorial matter should be addressed to the Hon. Editor.

●

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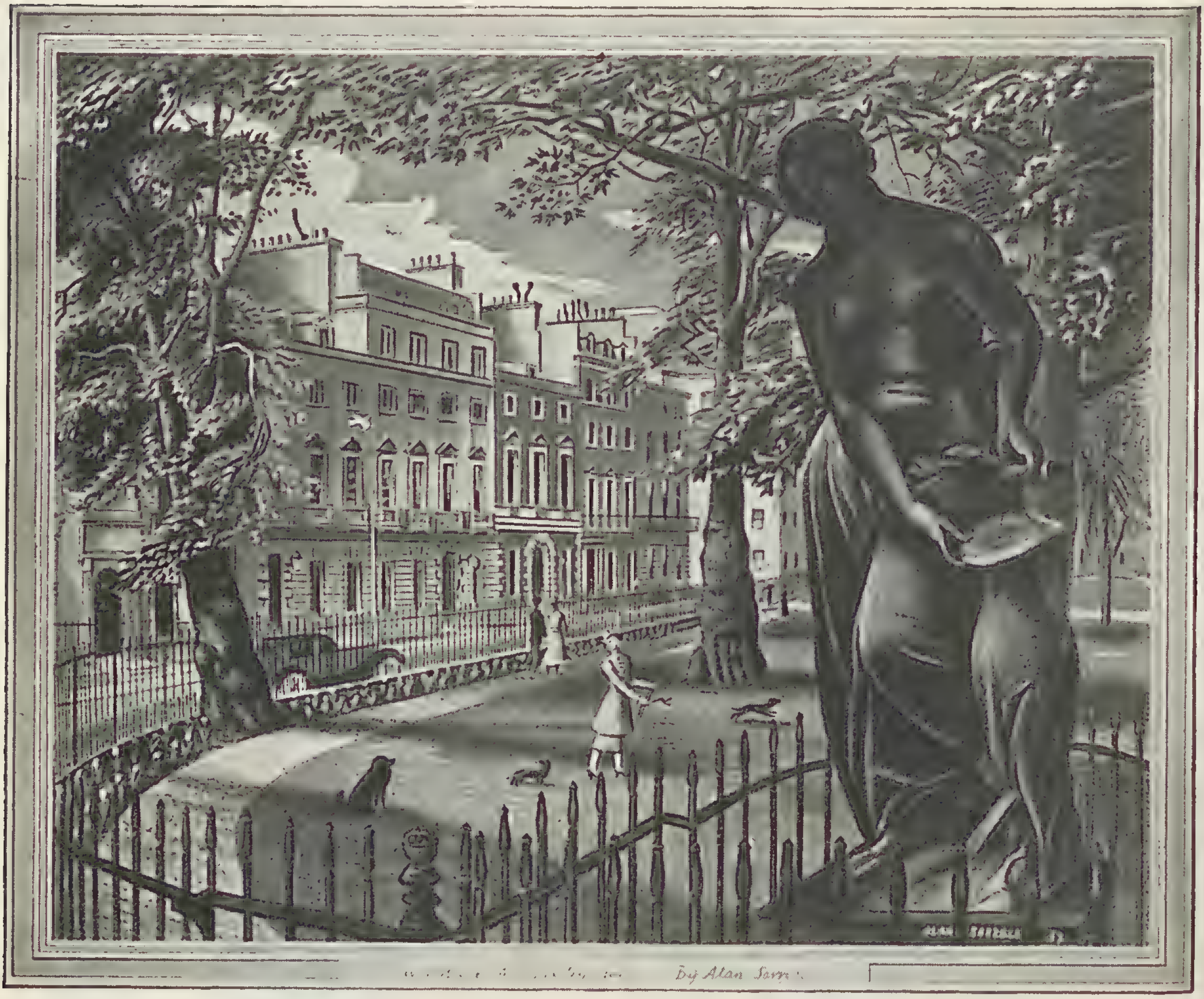

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Volume 5 **December, 1940** No. 4

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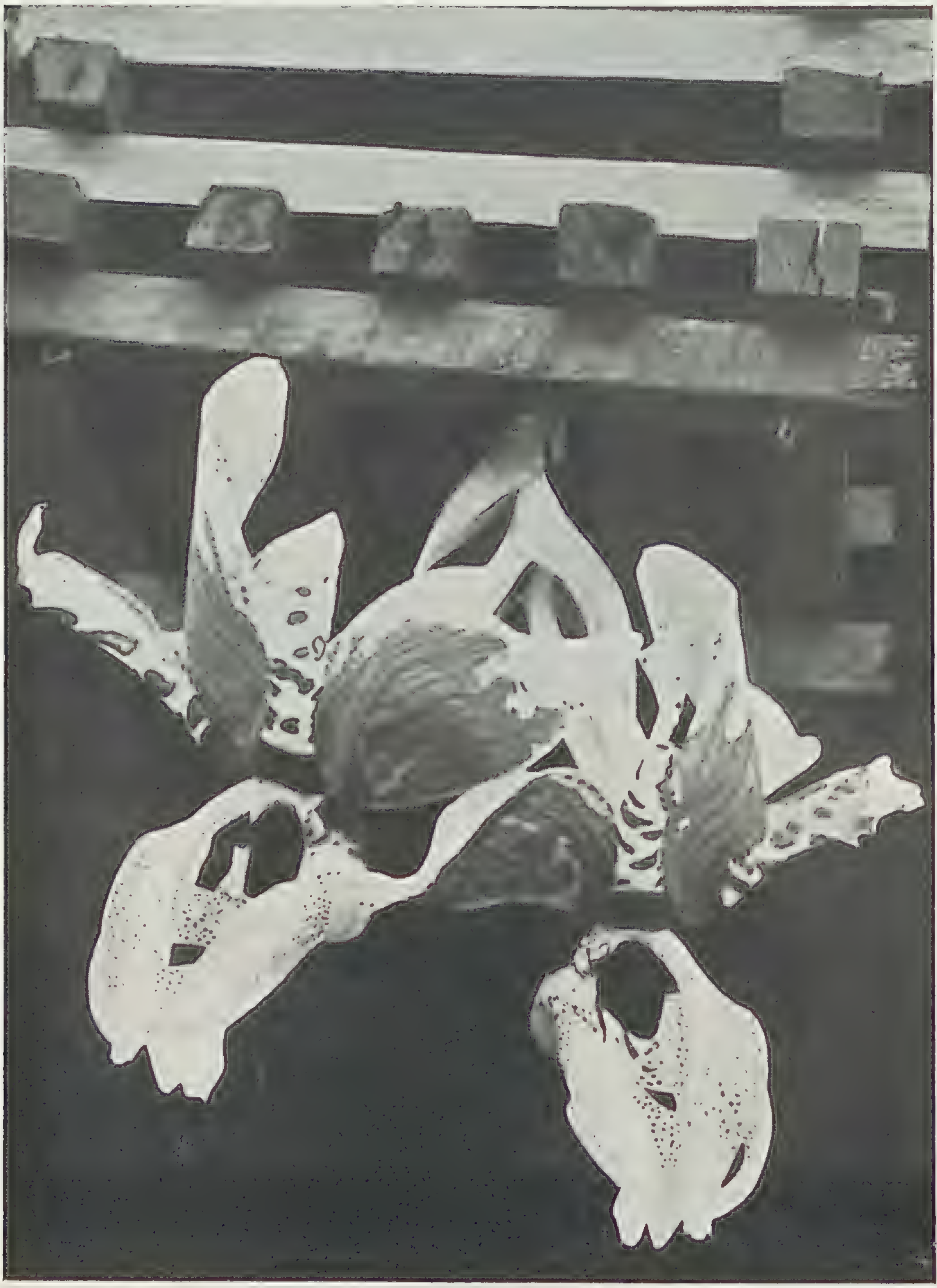


STANHOPEA TIGRINA (*Batem.*)
Grown by J. Murray Cox. Photo by J. R. Bailey.

Australian Orchid Review

Editorial

Fashion in Orchids

● When a hobby or a custom develops into an inordinate desire, its adherents usually display instability in their ideas about this or that constituent of the hobby or the custom. In other words, their ideas or desires drift from a general interest in the subject to sectional or specialized inclinations. They are ready to follow a lead which silently persuades them into an attitude commonly known as following the fashion.

We have fashions in dress, music, and other kinds of art; we likewise have them in politics, philosophy, warfare, and what not. The humble Orchid grower must be pardoned, nay forgiven, if he, too, displays this intensely human foible of following the fashion. And so we have fashion in Orchids.

The history of Orchids reveals how fashions have come and gone in cultivating various groups. In 1763 only four species of Orchids were cultivated in England. About that time, however, botanists were becoming very busy in classifying and listing plants from various parts of the world. In 1826 Loddiges' mentioned 84 species in their catalogue. The genera *Epidendrum, Oncidium,* and *Dendrobium* became firm favourites under cultivation. During 1834 collectors became active in Central America, the results of their labours giving impetus to Orchidology, the *Odontoglossum* and the *Cattleya* then becoming firmly established favourites, while *Epidendrum* and *Oncidium* drifted from prominence. Up till 1856 preferences for species continually changed, but during this year, and after, hybrids began to appear, until to-day there are very few Orchid lovers, comparatively speaking, who think entirely in terms of species. The hybrid has almost captured the bushhouse and the hothouse.

The recent comer with a long purse prides himself on the acquisition of "modern" hybrids, but some of the older varieties are preferable to many of the latest productions, both in colour and form. The notion of old-fashioned and new-fashioned hybrids is therefore a myth. The Orchid that possesses horticultural utility and beauty is the one we should pursue, and it matters very little whether it is a species, variety, or hybrid, whether it is old or new in discovery or production, so long as it fulfils its great mission of giving satisfaction and enjoyment to the grower.

Many of the recent catalogues list some of the very old hybrids which are still in demand, and some of the old hybrids are still in use to reinforce some of these recently produced hybrids. And further, some of the very old hybrids are being selected and improved to such an extent that some of those known as "recent" have to take second place. *Cypripedium Leeanum,* and *Cymbidium Gottianum* are both old hybrids of great worth, some of their forms being difficult to surpass, while *Cypripedium Maudiae* is still able "to flirt" with its discriminating attendant.

But what of the Sydney public, who buys Orchid blooms merely for their gaiety or novelty, to be worn at social functions. Information obtained reveals the fact that the public is very fickle in its fancies. The wealthy prefer a robust, colourful *Cattleya* or *Laeliocattleya* in preference to the extra large *Brassocattleya,* the large pink or red *Cymbidiums* take the eye of the middle-class, while during the *Cypripedium* season, size or attractive colour or both are in demand, a deeply coloured *Harrisianum* selling as readily as the more expensive type. In America, it is said, the albino *Cattleya* is much sought after by the public, while in England the *Cattleya, Miltonia, Odontoglossum,* and their numerous combinations are always in request.

The desires of the Orchid grower and the public generally will be the deciding factors as to those species and hybrids which will stay, and those that will disappear, for the fixing of the fashion in horticulture, as in other avenues of life, is one of those inexplicable movements which just happens by tacit agreement among all interested.

Cool House Culture and Notes for Amateurs

T. H. JAMES, *Longueville, N.S.W.*

● December, January and February is the Australian summer, and during that period there is little else to do except water, and that is a full time job. It has been stressed many times in this "Review" that no universal plan can be formulated on account of the widely differing conditions under which Orchids are grown, but, generally speaking, I believe that, provided drainage, light, and ventilation are all that they should be, overwatering of epiphytic Orchids is almost impossible during our summer. If circumstances permit, your Orchids would appreciate their foliage being sprayed several times during hot days, and even in the evening, unless a cold southerly wind is expected. When watering your plants do not merely sprinkle the pots or baskets, but see that they are wet through. Time may not permit some of you to give that constant attention which is so beneficial, and, in such cases, it would be better to dip the plants at frequent intervals than just sprinkle them each morning. With a large collection, of course, that is impossible. Inside a glass house the evaporation naturally would not be as heavy as in the bush house or the open, but if the house is ventilated as it should be, watering would be necessary at least every other day, natural climatic humidity notwithstanding.

In the bush house or in the open, sometimes watering becomes quite a problem, particularly with warm dry winds blowing. Endeavour to minimize evaporation by packing the spaces in the baskets with sphagnum moss. I grow as much as possible in the bush house—the teatree covering is so light that it can scarcely be called that—or suspended from trees. In some cases I found it useful to suspend the pots in a larger pot or wire basket and pack them with moss. A tub of water is useful in the bush house for dipping, and to add to the humidity. The tub should be completely emptied and exposed to the sun for a while about once a fortnight to prevent mosquitoes breeding. Small fish would serve the same purpose. Have plenty of foliage plants about, such as palms, provided they do not interfere with the light.

This matter of watering is much more important than many new Orchid growers realize, and an endeavour should be made to ascertain the natural habits of the various plants as a guide to treatment. Except for occasional species this knowledge is more important for other periods of the year. This information will be supplied to any reader who may desire it.

Closely associated with watering is the matter of light and air. For the glass house use the blinds as little, and ventilators as much, as possible. It is astonishing the amount of light and heat *Cattleyas* and *Dendrobiums* will stand up to, provided they are moist at the roots. As to air, I would again urge growing *Dendrobiums* in the bush house. The difference in growth is surprising. Thick, short jointed bulbs are developed, which are much more sturdy than those grown under glass, and they flower better. About, and north of Sydney, *Cattleyas* also grow well in a bush house. I have a plant of *Cattleya Gaskelliana,* which has been in the bush house all through the winter, but protected from rain by a sheet of glass. It has now produced a sheath, although I expect not more than one flower, as the bulbs are small because I have been unable, so far, to stop it growing. The present bulbs — five leads — commenced and matured during the winter. I am going to try and force a rest by placing it in a shady, cool spot, and withholding water. *Cattleyas* have very varying flowering periods, and after these have finished they require a decided rest, but should not be allowed to get quite dry.

The districts in which *Dendrobiums* grow naturally, differ so much climatically and their habits also vary so considerably, that it is impossible to formulate any practice that would apply universally. Frankly I can claim little more than occasional successes beyond *Dendrobium nobile* and *Dendrobium Wardianum.* I have lately been studying some particularly practical notes compiled by Mr. A. Murray Cox, of Brisbane, and can now understand the cause of some of my failures. Those notes have made it very clear that a knowledge of the habits of each species is essential to success.

In the June issue, a reader inquired regarding certain *Dendrobiums,* and as those species have been comparative or complete failures with me, I propose to pass on some of the information I have gleaned from Mr. Cox's researches. In the first place, I believe that best results are obtained by permitting plants to follow their natural inclinations. I mean that some species have a naturally erect habit, such as *Dendrobium nobile, Dendrobium densiflorum,* etc., whereas others produce pendant stems, such as *Dendrobium Pierardii, Wardianum,* etc. The pendant types should be allowed to develop accordingly. Mr. Cooper, of Sanders', advocated that treatment. The particular species mentioned by the writer under notice are *Dendrobium chrysanthum, D. Falconeri, D. aureum, D. dixanthum* and *D. Findleyanum.* The two first mentioned are pendulous and the remainder erect.

Generally *Dendrobium chrysanthum, D. aureum,* and *D. Findleyanum* prefer some heat during the winter, but north of Sydney that would be a diminishing factor. *Dendrobium dixanthum* requires some protection during winter, but should thrive in a glass house without any artificial heat. *Dendrobium Falconeri* will grow in a bush house all the year, but should get protection from rain during the winter. *Dendrobium aureum* and *D. Findleyanum* require copious watering during the growing period. Less water is necessary during autumn and winter, but the plants should never be allowed to become dry. *Dendrobium chrysanthum* and *D. dixanthum* require copious watering during the growing period and then a good soaking once in six weeks should suffice. *Dendrobium Falconeri* requires copious watering during the growing period, and then an occasional light watering only until the following spring. With the exception of *Dendrobium Falconeri,* all those under mention require plenty of light, either right up against the glass or preferably the open sunlight. In winter, I would suggest under glass. *Dendrobium Falconeri* prefers filtered sunlight. In a previous issue I instanced an excellently grown plant of this species which was suspended against the western wall (brick) of a glass house about 3 feet from the ground. After mid-day no direct light reached that plant. Wooden baskets are considered best for *Dendrobium chrysanthum* and *D. Falconeri* and pots for the remainder. As to composts, I have mainly used fibre only, as it permits free watering when necessary during the winter. Under my conditions the amount of air circulating causes evaporation even during the winter, and moss in the compost would hold moisture too long. In view of the copious watering recommended for most of the *Dendrobiums* mentioned, possibly a little sphagnum would be an asset. But whatever is used, ample drainage is imperative. Any holdup in the free passage of water would soon cause serious damage.

As previously mentioned, I am indebted to Mr. Cox for much of the above, and I take this opportunity of paying tribute to him. His work is perhaps the most informative and practical that it has been my privilege to read. It was hoped that it would be published in book form, but I am afraid that war conditions will render that impracticable for the present.

Cypripediums. Supply plenty of water—they should never be allowed to get dry. Maintain as humid an atmosphere as possible and protect from strong light.

Cymbidiums, during December and January, will require copious watering, and do not be afraid of sunlight. A slight yellowing of the foliage will do no harm, but protect the pots as much as possible from the hot sun, as the roots seem to burn easily. From February onwards the foliage will complete its growth, and the bulb will begin to swell. At this stage I believe the plants require much less water to encourage the development of flower buds. With one species, I have been quite unsuccessful, viz., (*Hookerianum*) *grandiflorum.* It grows well, in fact very well, but has not flowered. One plant produced a spike one year, but the flowers failed to open. It was suggested to me that in and around Sydney it requires cooler and shadier conditions than generally given.

Oncidiums. The species previously mentioned as growing well with me, viz., *Oncidium varicosum* var. *Rogersii* and *aurosum,* should receive copious watering and be placed close to the glass.

Lycastes. Water freely. Live sphagnum moss should be placed on top of the compost and kept growing. Give plenty of light and frequent applications of weak liquid manure.

Thunias will now be showing their flower spikes. As soon as these are noted, transfer the plants to the glass house or some shelter from the weather. This will tend to lengthen the flower spike and preserve the flowers when they open, which is generally just prior to Christmas. When flowering is over, move the plants outside again, and water freely until the leaves turn yellow.

Coelogyne cristata. Keep out in the open with plenty of sunshine and copious watering. If this plant gets dry, the bulbs will become ribbed, and it will take some time to recover.

Phaius. I would again suggest that this genus be given a sunny position in the bush house. The growth is sturdier and the flowering freer.

Dendrobium lituiflorum. In the June number of this "Review" reference was made to the habit of this species of dropping its flower buds before they open. It is a vigorous grower and during the summer should receive copious watering. It should also have plenty of light and air. It flowers in the autumn and then should be in a very dry atmosphere, but should never be quite dry at the roots until flowering has finished—and then no water until spring.

Watering on a hot day with cold water might cause the buds to drop. A sudden cold spell after a hot day, unless in a heated house, might also cause the buds to drop, particularly if the roots are wet.

When in bud it should be placed close to the glass for maximum light. Possibly the transfer of the plant from the glass house to a sunny glassed-in verandah might solve the problem.

● "I was very thankful when the photographing of Mr. Murray Cox's *Stanhopea tigrina* (frontispiece) was over, for being at close range with such a pungent odour as that given off by this species is not at all pleasant. But here it is, and glad to say the odour did not fog the air about the lens. The photograph gives a good idea of the manner in which it flowers from the base of the receptacle."—J. R. Bailey.

● The Queensland Orchid Society issued a Souvenir Programme for its Annual Orchid Display and Grand Patriotic Concert, held at the City Hall, Brisbane, Friday, October 11, 1940. Coloured pictures of Orchids, an article on Orchids, and a musical programme of popular, patriotic, and classical items, make it a charming memento of the occasion.

A Note on Dendrobium Taylori (F. v M.)

Fitzg. and D. Hispidum A. Rich

● In F. M. Bailey's "Queensland Flora" (vol. V., p. 1532), *Dendrobium Taylori* is treated as a variety of *D. hispidum*. It is curious that Bailey gives the reference to Fitzgerald's figures of the former, but omits such reference in the case of the latter, although Fitzgerald actually figures both on the same plate. It is, I think, generally recognised that these are distinct species; and the purpose of this note is not to labour that point, but to call attention to the fact that both have been removed from the genus *Dendrobium* by no less an authority than the late Dr. R. Schlechter.

In examining a number of Schlechter's New Guinea specimens in the N.S.W. National Herbarium, I came upon 15 species of the genus *Cadetia* Gaud., which apparently (though I have not been able to trace its history) was removed by someone, after Gaudichaud's time, to form a section of the genus *Dendrobium*. Schlechter restored its independence.

Some of the New Guinea species of *Cadetia* are so obviously very close to the North Queensland plants known as *Dendrobium Taylori* and *D. hispidum*, that it seemed to me, provided that Schlechter's restoration was generally accepted, that these two should forthwith be removed to the genus *Cadetia*. A search in the Index Kewensis (supplement No. 5) revealed that not only was Schlechter's restoration accepted, but that he himself had removed the two Queensland plants to *Cadetia*. In future they should be recorded as:—

Cadetia Taylori (F. v. M.) Schltr. Synonyms: *Bulbophyllum Taylori* F. v. M., *Dendrobium uniflos* Bail., *Dendrobium Taylori* Fitzg.

Cadetia hispida (A. Rich.) Schltr. Syn.: *Dendrobium hispidum* A. Rich.—Rev. H. M. R. RUPP, Northbridge, N.S.W.

A New Australian Species of Pterostylis

In the latest issue of the "Transactions of the Royal Society of S. Australia," the veteran orchidologist, Dr. R. S. Rogers, describes a new species of *Pterostylis* discovered by Mr. L. Horbury at Kumarl, near Esperance, W.A., and forwarded by Lieut.-Col. Goadby. The new plant, of which Colonel Goadby has kindly sent me several specimens, is very distinctive in form, and has been named *P. allantoidea* from the curious "sausage-shaped" labellum.

—H.M.R.R.

● The reduction of the number of pages in the "Review" is in accordance with the regulations issued by the Commonwealth Government. We shall endeavour to retain all the usual features and the magazine will resume its usual number of pages as soon as the authorities permit.

The Hybridization of Orchids

Dr. D. A. HERBERT, D.Sc., *Brisbane, Q.*

● The hybridization of different species of plants took place in Nature long before the interference of man in their family affairs. Pollen carried by wind, water, or insects frequently finds its way to alien stigmas, and often germinates there. Tobacco pollen, for example, germinates readily on the stigma of the flower of Hibiscus, though it can never effect fertilization. Where the species concerned are closely related, however, there is a possibility of a successful union, and a hybrid may result.

In 1881 the German botanist Focke made a list of over 900 wild hybrids, and since that time the number has been enormously increased. In the native Flora of New Zealand alone, there are hundreds of hybrid groups, each consisting of all grades of intermediates between the original parents. Plants of the most diverse groups, from algae and fungi to the highest flowering plants, have produced natural crosses; and, indeed, many botanists consider that this is an important method by which new species are evolved.

Orchids are amongst the families in which this natural hybridization has occurred, and in the Queensland Flora there are a number of species whose ancestry may reasonably be considered mixed. *Dendrobium gracillimum* is intermediate between *D. speciosum* and *D. gracilicaule,* and grows where these two species are abundant. *D. delicatum* has been suggested as being a hybrid between *D. Kingianum* and *D. speciosum.* Experimental verification is necessary for checking such theories, and in this connection the *D. superbiens* situation is of special interest.

As a result of his hybridization experiments, Dr. H. L. Lyon, of Honolulu, came to the conclusion that this beautiful species was a natural hybrid between *D. bigibbum* and *D. undulatum* (see the "Australian Orchid Review," March, 1938, p. 29). Mr. Holttum, the Director of the Botanic Gardens, Straits Settlements, however, published an article in the Orchid Review, London, in September, 1938, putting forward the opinion that *superbiens* is a cross between *veratrifolum* and *bigibbum.* A photograph of one of his hybrids between these parents is reproduced in the "Australian Orchid Review," March, 1939. He suggests that *D. Phalaenopsis* and not *D. bigibbum* may be one parent of the true *superbiens*; his main point, however, is that he considers *D. veratrifolium* and not *D. undulatum* to be the other probable parent. We may, I think, strongly suspect the hybrid nature of *D. superbiens* from the experimental evidence; but in spite of the approximation of the *bigibbum-veratrifolium* cross to this species, the natural range of the possible parents is important. *D. superbiens* grows where *D. bigibbum and D. undulatum* occur in the Torres Straits, and where *D. veratrifolium* has not been recorded; and this would seem an important item in support of Dr. Lyon's claim for *undulatum* as the other parent.

The first hybrid Orchid to be produced in cultivation was *Calanthe Dominii,* raised by Mr. Dominy in Veitch's nursery and named after him. It was a cross between *Calanthe masuca* and *C. furcata,* and flowered in 1856. This hybrid was studied by Charles Darwin when he was engaged on his great work on "Fertilization of Orchids," though his main observations were made on one of the parents. (*C. masuca*). Other hybrid *Calanthes* appeared soon after this first success, and results were so promising that more ambitious experiments were tried. In 1861 Dominy produced the first bigeneric hybrid, *Goodyera Dominii* (*Goodyera discolor* x *Dossinia marmorata*). The important initial steps had been made in Orchid breeding, first in crossing species and then in combining genera. A later development was to be the introduction of a third genus into the pedigree of artificial hybrids. *Sophrolaeliocattleya,* for example, is a group of trigeneric hybrids in which *Sophronitis, Laelia* and *Cattleya* are the genera blended; and *Brassolaeliocattleya* is the result of a series of crossings in which *Brassavolo, Laelia* and *Cattleya* have been combined. *Laelia, Cattleya, Brassavola, Sophronitis, Diacrium* and *Epidendrum* are distinct genera, but are sufficiently related to one another to be included in the same tribe, and it is within this tribe that the most spectacular intergeneric hybrids have been produced artificially. *Laelia* is noted for the beauty of its colouring, *Cattleya* for its form, and in a cross it is possible that both desirable characters may be continued. Many hybrids, of course, may combine the less desirable characters of two worthy parents, and herein lies the possibility of disappointment when unflowered hybrids are purchased. Many of the earlier *Laeliocattleyas* were mainly of interest because they were hybrids, and they have been dropped from dealers' lists as better types were bred. The *Brassolaelia* cross is not as shapely as crosses with *Cattleya* blood, though beautifully coloured; but when *Cattleya* is introduced to produce the trigeneric hybrid *Brassolaeliocattleya,* that fault is rectified.

In these instances the Orchid breeder has managed to combine desirable characters from different sources. The contributions of the different plants are often very diverse. One parent may provide the colour pattern and another the general shape. The *Epidendrums,* though their flowers leave much to be desired when compared with other genera of the *Cattleya* tribe, have one very important feature—they are mostly very vigorous growers. This would be a very useful character to infuse into some of the slow-growing types with better flowers. A number of hybrids have been made between *Epidendrum* on the one hand and *Laelia* and *Cattleya* on the other, the resultant crosses being known as *Epilaelia* and *Epicattleya* respectively. *Epidendrum Obrienianum,* itself a hybrid, figures prominently in the list of parents in the two series of hybrids. Another successful cross is *Epiphronitis,* the other parent in this case being *Sophronitis.* One of the most favourably known of this hybrid genus is *Epiphronitis Veitchii,* with scarlet flowers set off with bright yellow. It was produced from *Epidendrum radicans* and *Sophronitis Veitchii.*

The crossing of genera of Orchids has its limitations. It will be found that success is only attained when allied genera are crossed, and then by no means always. Dominy's first cross (*Goodyera* and *Dossinia*) was between close relatives. Attempts to cross, say, *Cattleya* with a distant relative such as *Cypripedium* or *Phaius* are exercises for an optimist, and on a par with trying to cross roses and strawberries.

Specific hybrids are, in general, easier to effect than generic hybrids. A cross produced between two *Dendrobes* may in itself be very satisfactory, but it does not show the full possibilities. It is a mulatto in which the characters of both parents are combined. But amongst those characters there will be some recessives, that is, features which are obscured by others. A cross between a purple and a white, for example, may produce a purple. The white is there and may show up in future generations; it is in this case recessive. If the seed produced by such an Orchid is planted, and the seedlings brought to flower, it will be found that all sorts of variations appear. The characters of the original parents are re-combined in various ways, and these second generation plants may give something which the breeder really aimed at in the beginning. A first generation hybrid is full of possibilities, and without doubt there lurk in many of our simple crosses, very great possibilities if they could only be followed out. With Orchids we are fortunate in having plants which are usually multiplied vegetatively — a method which perpetuates a hybrid in its original form; but this ease of fixing a type too often blinds us to the full possibilities that lie in its mixed ancestry, and which would be brought out by planting its seeds.

In conclusion I might mention that whatever purity of race may have signified to the Pharaohs as a hall-mark of aristocracy, that concept does not hold for Orchids. Many have been so repeatedly crossed and back-crossed that their pedigree is extraordinarily complicated. It is not enough to give a list of all the known ancestors, because one may have figured in it so often that its importance outweighs that of a species that has appeared only once. Mr. Charles Dunn has devised a simple scheme which illustrates graphically not only the species that have gone to make any particular hybrid, but the relative importance of each. The scheme has its limitations, because the number of times such a plant comes into a pedigree is not an exact measure of its contribution on account of possible recessive characters. Such considerations must be put aside, however, because we know so little about them at present.

● A letter has been received from Sir Arthur Hill, Director of Kew Gardens, England, by one of our members, Mr. F. A. Weinthal, saying that his son, Sergeant Ray Weinthal, of the A.I.F., had called at the Gardens.

The Director had taken him around the glass houses to view the Orchids, especially the Australian species growing there.

A subsequent letter received from Weinthal Jnr. confirms the interest taken by the Kew authorities in their collection of Australian Orchids.

We feel thankful that the Gardens and plant houses, so far, have escaped the onslaughts of the raiders from across the Channel, and sincerely trust that they continue to do so.

Fertilization of Orchid Plants

W. L. HAENKE, *Brisbane, Q.*

● In preparing this lecture, I realized that it is a most contentious subject, and even though few of you, perhaps, will agree with my views, the discussions and arguments which it gives rise to should be of benefit to us. As far as can be ascertained most of the commercial growers in both England and Australia are decidedly opposed to the using of fertilizers on Orchid plants. In saying this I may be unjust, but really I do not blame them in their opposition, as fertilizers in most cases make *Cattleyas,* for example, grow from both eyes, so that instead of a plant just keeping one lead, the number increases as the various powers of two, viz., two, four, eight, etc., so that in a very few years quite a number of plants could be obtained by the division of the original.

If Orchids are observed in their natural state, they will generally be seen growing on the under sides of trees so as to get the greater proportion of the water which would run down the trunks. Now this water must undoubtedly contain in solution, and carry with it, the excrement of birds and animals which live among the leaves and branches. Thus in the natural state Orchids undoubtedly receive fertilizers in the water.

Most Orchid growers like to think that Orchids are the highest form of plant life, and I am assured that they are at least the highest form of the monocotyledons, so that in this sense we may compare them with man in the animal kingdom. Now no one can argue that man—particularly civilized man—has improved his health and constitution by the use of the better and more nourishing foods that civilization has made available in the latter years. So why should Orchids not be given fertilizers, as they undoubtedly improve the growth and flowering of the more common plants we all have in our gardens.

The American growers are definitely having beneficial results from the use of fertilizers, and Prof. A. E. White in "American Orchid Culture" writes: "Orchids, like all other plants, are benefited by occasional applications of liquid fertilizers, particularly during the period of rapid growth. Various experiments at Cornell have proved that growth of Orchid plants is stimulated by weekly applications of a solution similar to that used in seed germination."

Dr. H. O. Eversole, of California, is investi-

CYMBIDIUM X CHARM
A Fine Hybrid
Grown by L. Newman. Photo by E. A. Hamilton.

gating nutrients, light intensity, temperature and humidity to adjust the plant sap to the optimum pH. He is also working on automatically controlled temperature and humidity to follow the light so that plant respiration is favourable to photosynthesis.

I will now deal alphabetically with the more popular types and the fertilizers used.

Calanthe		Dried cow manure and little blood and bone.
Cattleya	(1)	Small amount of Shirley's No. 3 per week.
	(2)	Tablespoon of superphosphate and blood and bone.
	(3)	Liquid type for dipping: 2 teaspoons of floraphos with bone dust and dry blood in 4 gallons of water.
Coelogyne		Weak liquid manure once or twice a week.
Cymbidium		Weak liquid manure and 1/3 cow manure in the compost.
Cypripedium		½ cow manure in compost.
Dendrobium		Blood & Bone.
Epidendrum		Cow manure.
Phalaenopsis	(1)	Nutrient solutions
	(2)	Shirley's No. 3
Vanda		Blood & Bone

Space will not permit going into all of these more fully, but I would like to demonstrate my test *Cattleya*. It was backcut in December and the leads from the forward growth and back cut both flowered. These leads immediately sent new growths, the forward one flowering and now from these four more growths have come, but at the present it cannot be seen if they will flower.

Now all my *Cattleyas* are being fertilized, and none has shown ill effects. The first member of our Q.O. Society to use superphosphate, and blood and bone, did it over five years ago on the one *Cattleya* he then possessed. He now has seven plants from that one, and has given away probably as many more. They are not small plants, some of them having over ten growing leads.

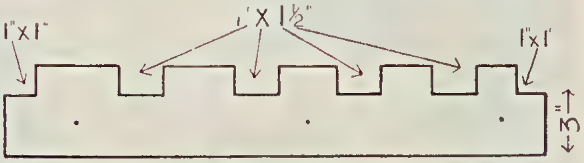
Dr. Eversole in "American Orchid Culture" writes:—

"We have carried through a number of series of experiments with *Phalaenopsis* in the sand nutrient solution method since 1933. The seedlings are planted in sand flats direct from the flask and re-flatted as growth demands more space. The flats are dipped in nutrient solution when the sand dries out and occasionally washed with a fine hose spray to clean the sand. Most series begin to blossom in nine to sixteen months and generally all have blossomed at least once in eighteen months.

"While the use of nutrient in Orchid growing is still in the experimental stages, it is believed that in the near future there will be beneficial results in Orchid growing, both with the use of nutrients and in air-conditioning greenhouses."

● *Coelogyne cristata*.—We are told (A.O.R., Dec., '36, p. 6; March, '37, p. 20; June, '39, p. 59) that *Coelogyne cristata* is particularly hard to establish, and that it must not be overwatered until established. In other words, drainage must be perfect, as the species dislikes disturbance. It can be potted in pots, boxes, wire baskets, the English method of wire netting funnels, or fastened to tree fern trunks.

The following is a design of a loose bottomed box, which gives perfect drainage and also enables the plant to be transferred to a larger box, when necessary, with the minimum of disturbance. The box is constructed of 10 inch x 1 inch timber, any size required. Two brackets are cut from 1 inch timber as per sketch, one being nailed on the inside of each end; then 1 inch by 1½ inch battens are laid (not nailed) loosely in the sockets. I cut a mat of osmunda to fit the box, then build up the usual compost on that. The drainage is perfect and cannot waterlog, whilst the whole plant can be pushed out, and transferred to a larger container, leaving the shell of the old box intact for use again, if sound. —C.O.D., 28/3/1940.



● Three outstanding *Cymbidiums* at the Orchid Society's (N.S.W.) August meeting: *Gottianum* x, Mr. C. Cambourne; *Charm* x, Mr. L. H. Newman, and illustrated in this issue; *Carisbrook* x, Smarts' Garden Service.

● Four notable exhibits in full flower at the Orchid Society's (N.S.W.) meeting on Thursday evening, September 26: *Ansellia nilotica*, and *Phalaenopsis Schilleriana* (46 flowers), exhibitors Mr. and Mrs. S. Mills; *Cymbidium Alexanderi* var. *Westonbirt* x *Toucan*, exhibited by Mr. W. Fahey, illustrated in this issue; *Dendrobium* x *Thwaitesii*, shown by Mr. W. Palmer.

Growing Cymbidiums in the Brisbane District

A. BECKLEY, ***Wellington Point, Q.***

● When our Honorary Secretary suggested that I should contribute a paper on *Cymbidiums* I, at first, deprecated the idea because of insufficient experience. Afterwards I began to think that my methods and results might be of interest and possibly help some of our members, and as that is one of the reasons for which we exist, I am "holding forth."

Now it must be admitted that a great many *Cymbidiums* owned by our members are not doing at all well, and no doubt the reason—one that is very usual in Orchid growing—is that they are not receiving correct treatment, although it is not at all difficult to accommodate them in that respect. The plain truth is, it appears to me, that growers have not fully grasped their requirements, and until they do so their plants will continue to stagnate and rarely accomplish a flower spike, if they do not actually become victims of disease. Under suitable treatment they are steady and constant growers.

Some five years ago I was not at all favourably disposed towards these gems of the Orchid world. I considered them as bushhouse plants, as indeed they are, for no one should try to grow them under glass—and I was anything but keen on bushhouse Orchids owing to insect pests, etc. However, a friend in Melbourne sent me a few propagated plants—that is, just two or three old bulbs with a good young growth or two, and as they were smart looking and evidently good growers I at once became interested and potted them in 6 inch pots with great care—they had many nice new healthy growing roots. They began to establish them-

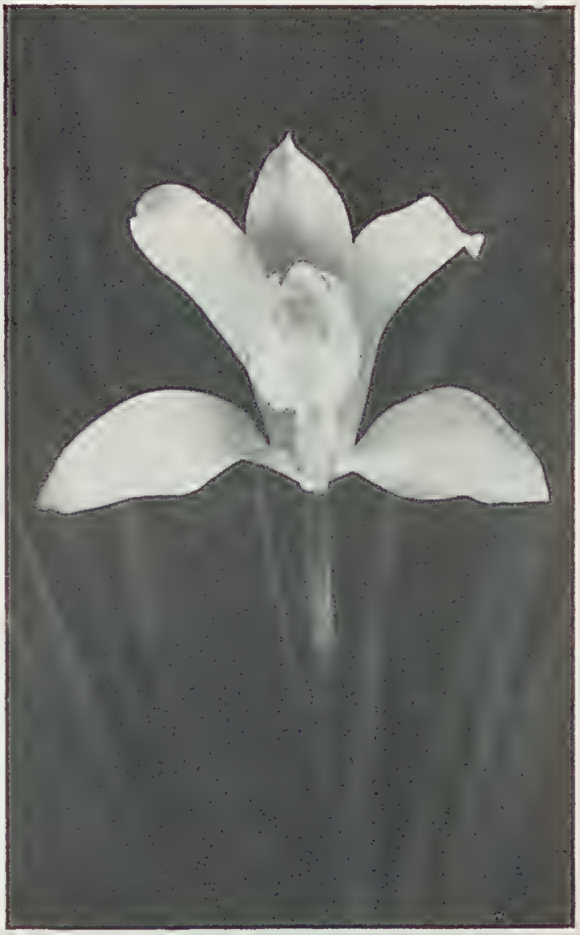
CYMBIDIUM ALEXANDERII, *var.* WESTONBIRT X C. TOUCAN
A Choice Hybrid
Grown by W. Fahey. Photo by Turner Studios.

selves in a very few weeks after I had placed them on the damp floor in my *Cypripedium* house to start them off. I then brought them outside into the bushhouse into a fairly shady place, and in the course of a few more weeks I noticed that the foliage which was of a rather pale colour had turned a dark green under the influence of the outside air and light. I had potted them in a very porous mixture of good potting soil and fibre, and during the first year they made steady progress and rewarded me with a couple of small spikes the following winter.

They are now in 8 inch pots, together with other plants acquired from time to time, and are with three exceptions all propagated from back bulbs in the same way. When I repotted into 8 inch pots I used a mixture of 50 per cent. polypodium fibre, 50 per cent. good rich potting soil with all the finer material discarded and plenty of crushed crocks, sand and charcoal. The soil is so porous that the water runs straight through the pots, and this leads me to an important point that I want to stress. It is, in my opinion, desirable that established plants should be thoroughly and frequently watered and never allowed to get dry. Particular care should be taken to see that the pots are always damp, and they should be placed close enough together to prevent the sun from heating the pots and wind from drying them. They should stand on a damp porous floor and not be elevated, as that means difficulty in retaining the moisture. A bed of ashes is an ideal bottom for them. As to light, I believe that broken sunlight is what they require, and protection from wind, not only to retain moisture, but also to preserve the leaves, which break down rather easily with the wind. The retention of all leaf is, in my opinion, very important, and for that reason they should not be moved about more than is absolutely necessary.

With regard to flowering, I have found that plants sometimes miss a year, and although I have some 17 spikes this year against 9 last year, there are two or three plants which have missed. I do not know the reason, but it is not because I left the spikes on too long last year, for I cut them all quite early. I am inclined to think I did not supply sufficient water last year during the time the spikes were developing, which caused them to be rather late. I consider they are nearly a month earlier this year. I have occasionally seen spikes with the flowers clustered together instead of being well spread out on the spike—this is a danger sign that moisture was insufficient or that roots are unhealthy. As early March is the time for spikes to develop, it has been suggested that to prevent new growths instead of spikes developing the plants should be slightly dried. Flower spikes do not always come from fully grown bulbs; often they appear before the bulb has attained its full size, and grow with it. They are a long time making growth, often from March to August before the flowers open.

With regard to manuring, I am not one to advocate this, but I do think that it would be good for *Cymbidiums* that are well established, provided it is supplied weakly and regularly. Until then I prefer to rely on good rich potting material.



CYMBIDIUM EBURNEUM, *Lindl.*
Grown and photographed by A. W. Dockrill.

● *Cymbidium eburneum* has its home in Sikkim, Nepal, and Khasia, with a wide range of altitudes, being commonly found between 1000 to 3000 feet, about 27 degrees north. Intermediate treatment will suit it in New South Wales and Queensland.

Cattleya Growing in Brisbane

J. SMOLINSKI, *Brisbane, Q.*

● My twelve years' experience in growing Orchids comprises firstly *Epidendrae,* then *Dendrobiums,* and for five years I have been growing *Cattleyas.*

I have a glasshouse which covers over 400 square feet, facing north-east, in which I grow my Orchids. During the summer months I have a lattice covering over the wire to save the glass from hail storms, and about the first of May I remove the lattice frames for the cooler months. At times I have had the thermometer up to and over 100 degrees. On these occasions I hose the floor at mid-day, and also spray some of the overhead plants, and over the top of the glass roof with a light spray, which brings the temperature down 10 to 15 degrees in a few minutes. During the colder months when the thermometer shows under 40 degrees I heat the glasshouse for a few nights.

I hang all my *Cattleyas* 12 or 18 inches from the glass roof. Most of my Orchids are grown in wooden baskets from 5 inches up to 10 inches made from Beech or Cedar. I have several different shapes and kinds. Some of the plants have up to 22 growths in three years. I seldom break up a plant unless something is going wrong, or to make more plants.

Most of my plants have been obtained through the Queensland Orchid Society and our genial friend Mr. J. R. Tanner, also a few from Mr. A. Glindeman. Both gentlemen are Orchid growers and very interested in these plants. That is where I got the idea to take up this hobby and pastime, so I joined this wonderful Society.

To grow *Cattleyas,* I use Mr. A. Glindeman's osmunda and polypodium fibre from North Queensland, also broken crocks and charcoal for drainage, etc. When I water the plants for the first few months after planting, I just use clean tank water, and when growth begins I put 2 teaspoons of floraphos and a little bone dust and dry blood in a 2 gallon bucket, then 4 more gallons of water in a large tub. I add the mixture to the tub, but keep a certain amount back to keep the mixture up to the strength for the last few plants. I then soak the plants when they have dried out, and let them drain over the tub until the draining has stopped. Then I sponge the leaves with clean water and hang the plants in their places. I do this every fortnight during the growing season, but very sparingly in the colder months. I have some plants with large leaves over two feet in height.

When the buds peep through, and then some morning the flowers appear, one cannot help smiling with admiration at Nature and her way of creating the beautiful colour and perfume which greets him.

I have had one *Cattleya* plant for over three years which has not yet flowered. When it does I expect something "out of the box." It has over twenty bulbs and is growing well. There are several other *Cattleya* growers in this country who give wonderful information on how to grow these plants. My firm belief is that situation is everything, particularly on highlands, and especially shelter from westerly winds. Keep on persevering and you will succeed in the end.

● ***Orchids in Adelaide.*** The largest display of Orchid blooms ever seen in Adelaide was shown in September, when the year-old Orchid Club of South Australia staged a large representative collection at the annual show of the Carnation, Daffodil, and Sweet Pea Society, in the Adelaide Town Hall. The Club had been asked to help make an attractive display at the show, at which no prizes were awarded, all proceeds going to the Red Cross Society. The exhibit, which covered a bench 40 feet long, included *Cymbidiums, Cypripediums, Angraecums, Dendrobiums and Cattleyas.*

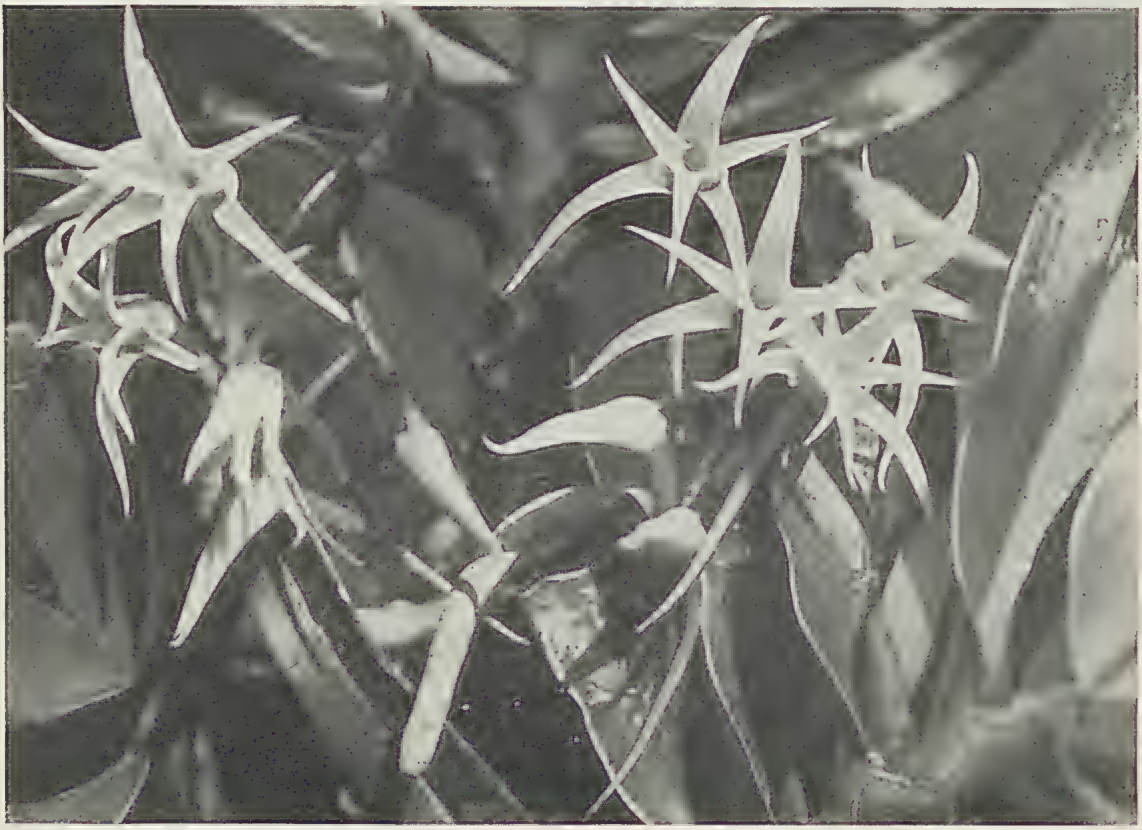
● At the Sixth Annual General Meeting of the Orchid Society of New South Wales, held on Thursday, September 26, 1940, the following officers were elected for the ensuing year:—President, Judge H. F. Markell; Vice-Presidents, Mr. E. A. Hamilton, The Rev. H. M. R. Rupp; Honorary Secretary, Mr. T. H. James; Honorary Treasurer, Mr. G. J. C. Tosi; Honorary Editor A. O. Review, Mr. P. A. Gilbert; Committee, Dr. C. A. Jaede, Messrs. F. Douglas, C. C. Hildebrandt, W. Palmer, G. H. Slade, W. H. Slade, W. Worth.

● Membership subscriptions to the Orchid Society of N.S.W. are now due for 1940-41. An early settlement of arrears is also requested. The newly appointed Treasurer, Mr. G. J. C. Tosi, 39 Martin Place, Sydney, will be pleased to receive a remittance.

An Orchid Picnic

E. P. FIRTH, *Fort Ternan, Kenya Colony*

● War conditions and petrol rations have put a stop to Orchid hunting expeditions, so I am afraid I shall not have any new discoveries to write about, and shall content myself and, I hope, readers of the "Australian Orchid Review," with a pre-war Orchid picnic, describing the finding, and subsequent culture, of a very fine *Cyrtorchis* species, which Kew believed to be *C. Whyteii*, but of which I am very doubtful. I am doubtful because another species I sent previously was thus classified, and the plant from which it came was of an entirely different habit of growth. However, Kew cannot classify Orchids correctly unless whole plants are sent them in spirits, and this I failed to do. We were on a picnic, and sat down to lunch by the Sondu River, where it flows through steep hills, wooded in parts, at somewhere about 6000-6500 feet above sea level. Whilst lunch was being unpacked from the car, I took our "boy," and made towards a patch of large trees overhanging the river, about 100 yards off. We had a regular fight with the undergrowth and tangled grass 8 feet high, which covered the precipitous bank of the river down to the water's edge, but with the use of a machete we got to our destination rather the worse for scratches, as every creeper and monkey rope was covered with thorns. Over the river hung a large tree, and on one of its limbs some 60 feet up I could see an Orchid, which I recognised as a *Cyrtorchis*, covered with sprays of large white flowers. Kipkoski preferred to climb the tree without his blanket, and so I took care of it while he started to shin up the smooth trunk, without anything on. Twenty feet above the ground, branches started, and from there the climb was easy, and the Orchid was soon reached. I instructed him to prise the roots carefully away from the branch, and after a few minutes he was on his way down



CYRTORCHIS SP. (*Whyteii*)?

Photographed by E. P. Firth, Kenya Colony.

with the prize in one hand, holding on with the other. At the 20 feet mark this was no longer possible, and so I told him to drop the plant as carefully as possible for me to catch. It landed in my hands roots first, and not a leaf or flower was damaged thereby. It was indeed a beauty. There were three main growths 18 inches high, from each of which two 9 inch spikes, carrying 7-9 flowers each, protruded. The flowers, 3 inches in diameter, were pure white, having spurs 4 inches long, and deliciously scented. In all, the Orchid carried about 50 blooms. In due course it arrived in my Orchid house, undamaged, as my wife nursed it carefully on her lap all the 120 miles home, over our rough Kenya roads. It was potted in a large basket, with broken brick, charcoal, and bone chips, on top of which was placed a pad of coir fibre, bits of chopped date palm leaf rib, but no moss, leaving the roots exposed on the top, bare of any covering.

Now after a year it has rooted and grown a lot, but it has not yet flowered again. It may be due to the severe drought conditions which we have experienced since 1939, or perhaps to the difference in altitude and temperature. Here we are only 4800 feet above sea, a difference of some 1200-1500 feet from its natural habitat, and a considerably warmer average temperature. However, with normal rains again, I still hope it will flower once more. I don't see why this should not be, for *Ansellias* from the coast grow and flower here, at nearly 5000 feet above their usual dwelling place, and *Polystachyas* from 7500 feet flower well.

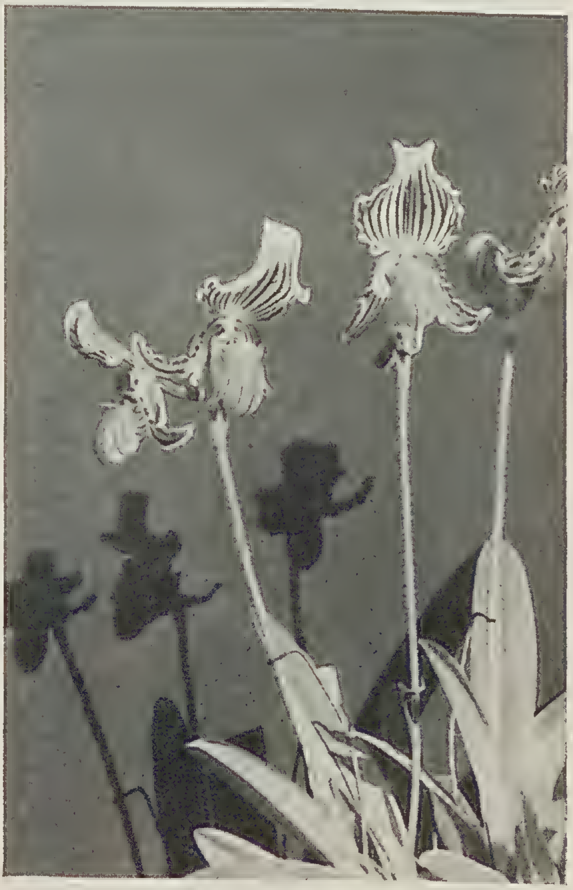
In conclusion I would mention that *Cyrtorchis* is related to *Angraecum,* and looks very much like a *Vanda* or an *Aerides.* It has thick woody stems and fleshy bi-lobed yellow green leaves, 1-2 inches wide, six to 10 inches long. Many aerial roots push out from the stem, fixing themselves to the host tree, others twining round the stem, often making a matted tangle from which new shoots emerge. It requires about 3 months dry resting period, in our hot weather, but in its natural habitat is subjected to some thunder showers during this period. With regard to treatment in a collection in Australia, I should imagine that a bushhouse should suit it in summer, but naturally it does not stand low temperatures, and anything under 50°F. would be detrimental to it. It requires light shade, early morning and afternoon sun, plenty of moisture whilst growing, and not too much heat. About 80° F. is the maximum it requires, and preferably between 65° and 75° F. Basket culture is the best, as it likes to spread its long fleshy roots, which will eventually twine all round the basket and in and out of the slats.

Cypripedium Fairrieanum *Lindl.*

● Mr. Evan Senior, of Adelaide, writes:—

"I notice on page 77 of the September issue of the "Australian Orchid Review" a paragraph by Mr. D. Symon, of St. Peters, in this State, mentioning the flowering of his *Cypripedium Fairrieanum* with two flowers on a scape, and your comment that it is decidedly unusual.

"My plant of the same species has done this, sometimes on all scapes sent up—and last year there were seven—for the past three years. I am forwarding a picture I took during the 1938 flowering, which shows two perfectly formed flowers on the left scape, the extra bud just coming on the centre scape, and the extra flower, malformed this time, on the right-hand scape. I have been growing the plants for a few years now."



CYPRIPEDIUM FAIRRIEANUM *Lindl.*

Grown and photographed by Evan Senior.

Cultural Notes on Phalaenopsis Schilleriana and Ansellia nilotica

S. M. MILLS, ***Westmead, N.S.W.***

● In response to requests for an article on *Phalaenopsis Schilleriana* and *Ansellia nilotica,* I will endeavour to give an outline of the potting and treatment of each. I do not profess to know a great deal about Orchids, having been interested in them for only the last three years, but for a considerable time I have grown most garden flowers with considerable success, and I think that experience helps considerably with Orchids.

The plant of *P. Schilleriana* which was shown at the last meeting arrived from the Philippine Islands about three years ago, in very good condition. It was potted in a small teak basket, in *Cattleya* mixture with perhaps a little extra sphagnum moss. Live moss was placed under exposed roots, and when the roots extended through the basket, black "Wingello" fibre was placed round the roots and basket. The compost is kept damp at all times, even in winter. In the summer the whole plant is sprayed lightly every day and in winter often enough to keep it damp. Twice a year the old moss is removed as far as possible and replaced with live heads. The leaves are frequently washed and every three months sprayed with "X.L. All." Last winter the minimum temperature was 60°F., but this year it was reduced to 50° with no apparent harm, as last year the one spike had 43 flowers and this year 46. The plant is hanging on a glass partition dividing the two houses, and over the dipping pond, facing south, and being well shaded during the hot months.

The plant of *Ansellia nilotica* was procured from South Africa about two years ago. It was tied to a piece of tea-tree log, then tree-fern fibre was wrapped around the log enclosing the roots. It was then placed on the bench in the south-east corner of the house. There is about one inch of shell grit on the bench and the roots have gone right through the fibre and into the shell grit, where there is quite a matted mass of them.

Last year two growths flowered—about 100 flowers, which lasted for quite three months. This year it made four new growths, which all flowered, carrying over 200 blooms. It seems a very hardy and easily grown plant, making a wonderful show, and in every way a very desirable addition to any collection. It is grown in the same house as the *Phalaenopsis,* and is sprayed daily during the hot weather, and only enough to stop it getting quite dry in winter. It gets the general spraying with "X.L. All" every three months.

Hoping this effort will help others to get good results and give a little of the pleasure to others that I get from reading articles in the Review.

Orchids of Mount Flinders

R. A. HUNT, ***Ipswich, Q.***

● These notes may be of interest to South Queensland Orchid enthusiasts, some of whom may not realize the extensive growths of *Dendrobiums* that mat the cliff crevices of Mt. Flinders (2246 feet). I have often been "on top" at this enchanting mountain area, and each time I have been struck by the graceful growths of several *Dendrobiums.* The mountain is not very difficult to ascend, fairly easy ways being through Rockton and Peak Crossing along somewhat notorious bush roads. Once "on top," we begin to scout round on the eastern, southern and western faces, seeing on each very robust plants of *Dendrobium delicatum, monophyllum* and *Kingianum,* while on the small rocky ledges the cheery growths of *Liparis reflexa* meet the eye. On the Mt. Welcome side of Mt. Flinders, there is a solid outcrop of rock overhanging the valley, on which are extensive colonies of *Dendrobium monophyllum* and *delicatum,* while occasionally *D. linguiforme* shows up. About 1500 feet up the western ascent, a small solitary rock rises out of the stunted acacia, supporting a notable colony of *Liparis reflexa, Dendrobium monophyllum, D. delicatum* and *Bulbophyllum exiguum.* On the southern slopes, *D. speciosum* variety *nitidum* is found in isolated clumps near the rocky screes leading up to the Red Cliffs. The screes house healthy growths of *Sarcochilus Cecilae,* and *Cymbidium iridifolium.*

The Sixth Annual Exhibition

● The Sixth Annual Exhibition of the Orchid Society of New South Wales was held from September 11 to 13, 1940, on the Sixth Floor, David Jones Ltd., George Street. The opening ceremony was performed by the Lady Mayoress, Mrs. Stanley Crick.

About 28 exhibitors staged 470 plants. At the 1939 exhibition 45 exhibitors displayed about 630 plants. There were more species at the previous show.

The attendance exceeded that of last year, about 1045 paying for admittance on Wednesday, 1624 on Thursday, and 2595 on Friday, the proceeds mainly augmenting the Lord Mayor's Fund (Younger Set) and the Food for Babies Fund.

A feature of the show was an exhibit of *Dendrobium* and *Vanda* hybrids received from Mrs. A. Van Brero, of Nylandweg 86, Bandoeng, Java. The donation was sent free of all charges, arriving at the Exhibition on Wednesday at 1.45 p.m., being under transportation for 2¼ days. The Royal Netherlands Indies Airways Ltd. (K.N.I.L.M.) delivered them free of charge.

The Orchids arrived in two baskets fitted with frameworks of bamboo to which the sprays were securely tied, the stalks being wrapped in damp wadding protected by waterproof paper. Captain A. Reyers, who was in command of the aeroplane, visited the exhibition to see how the Orchids opened up. They were quite fresh on arrival, attracting great attention throughout the show.

There was an excellent assortment of *Cymbidiums* which appeared to be an improvement in colour, size, and shape on those shown last year. The labelling, however, was very poor, it being difficult to get the names of the outstanding varieties. The exhibitors, with prominent varieties following their names, were:—His Honour Judge H. F. Markell (*Laeliocattleya* x *luminosa*); Mrs. A. Van Brero (*Vanda affine* =*teres* x *suavis*); Mrs. M. D. Mitchell, Dr. A. C. Burstal, Dr. C. Hall, Messrs. C. H. Deane (*Cymbidium* x *Falcon*, *Cypripedium Charndon*); T. H. James, M. Murray Moodie, G. K. Cowlinshaw, F. Douglas, S. Symonds, E. W. Usher (*Cymbidium* x *Cyzara*); G. Cruikshank, W. Fahey (*Cypripedium* x *Alibaster*); W. J. T. Plowman (*Dendrobium nobile* var. *nobilius*); C. Cambourne (*Cymbidium* x *Ambly*, *C. Badman Moor*, *C. Carisbrook*, two varieties, *C. Gottianum*, *C. Baldur*, two old hybrids with excellent shape and colour); W. Rothwell (*Cymbidium Carisbrook*, *C. Dorchester*); L. Newman, John Bisset (*Cymbidium Swallow*, *Dendrobium* x *Austinii*); Smarts' Garden Service (*Cymbidium* x *Carisbrook*, also ornamental plants, palms, etc.); Taylors (*Cymbidium* x *Minavet*, *C. Baldur*, *C. Swallow*); E. A. Hamilton (*Cymbidium* x *Swallow*, *C. Erica Sander*); H. R. Walters, T. W. Nelson, P. L. Meech (*Cymbidium* x *Esmeralda*, nice type, *C.* x *Dipper*); A. B. Porter (*Cymbidium* x *Algol*); S. M. Mills, D. Adamson (*Cymbidium* x *Swallow*).

The indefatigable efforts of our Honorary Secretary, Mr. T. H. James, energetically supported by Messrs. J. Bissett, F. Douglas, and W. Palmer, helped considerably in making the Exhibition a complete success so far as the Society was concerned, while the ladies associated with the Funds mentioned above could not have done more in bringing about the very satisfactory financial results, each Fund receiving £106/10/1.

Smarts' Garden Service supplied a number of showy ornamental plants, free of charge, which enhanced the floral surroundings.

Messrs. David Jones Ltd. granted the use of the 6th floor rent free, besides rendering other valuable services, such as publicity, ticket writing, etc., the general arrangements being in the capable hands of Mr. Biddulph, a member of their staff.

● *Cymbidium insigne* is the outstanding species of the genus in French Indo-China, being found in Annam at altitudes up to 5000 feet, the latitude of the habitat being 15 degrees north. It therefore requires intermediate conditions in New South Wales and Southern Queensland. The species flowers around Sydney under bush house treatment.

● Mr. N. A. Wakefield reports the discovery of *Diuris longifolia* well on the New South Wales side of the border near the Genoa River.—H.M.R.R.

● The currency restrictions have been removed from the Netherlands East Indies (Java, Sumatra, etc.), which are now included in the sterling bloc, consequently Orchids can be imported in the normal way obtaining within the British Empire.

A History of Australian Orchids

C. T. WHITE, *Government Botanist, Queensland*

(Begun in Sept., '40, issue, Vol. 5, No. 3, p. 89.)

● It may be of interest to members of Orchid Societies to have a few notes on these men who have played a big part in the history of Australian Orchidology.

Smith: Sir James Edward Smith was a wealthy Englishman to whom England owes a great deal, as he was the founder of the Linnean Society of England, and purchased from Sweden the collections of Carl von Linne, whose name is better known perhaps in the latinized form, Linnaeus, and these collections were deposited in London with the Society. Linnaeus was the founder of the present system of botanical nomenclature, and his collections of pressed specimens of plants are regarded as the most valuable set of "types" in the world. Smith was born at Norwich in 1759, and died at the same place in 1828. He described many Australian plants, and his specimens are preserved to-day at the Linnean Society's rooms at Burlington House, Piccadilly, and represent a valuable reference collection for Australian botanists. They have been moved into the country for the duration of the war. The collections of Linnaeus were moved during the crisis of 1938, and have not been placed back in London. Smith's work, "Exotic Botany," published in 1804-5, contains some of the earliest descriptions and coloured plates of Australian Orchids, notably *Dendrobium speciosum,* and three species of *Diuris.* It also contains an illustration of *Dendrobium linguiforme,* our common Tongue Orchid, described in 1800 by the German botanist Schwartz, the earliest named of our *Dendrobes* and perhaps of our Orchids.

Brown: Robert Brown, who was born at Montrose (Scotland) in 1773, and died in London in 1858, was one of the greatest of British scientific men. He was held in high esteem in scientific circles in Europe, and during his lifetime was elected to many Continental scientific bodies. Brown was educated at Marischal College, Edinburgh, and later trained in medicine at Edinburgh. He did not take his degree, his whole heart and soul being in the study of plants. After a short career as army surgeon in the home forces, at the end of 1800, he received, through Sir Joseph Banks, an offer of the position as naturalist aboard the "Investigator," about to be despatched to Australia under the command of Matthew Flinders. The story of the voyage of the "Investigator" is too well-known to Australians to repeat here. It might suffice to say that on his return to Sydney, Flinders, finding the "Investigator" quite unseaworthy, left in the "Porpoise" for return to England via Batavia, taking with him many of Brown's best specimens, which were lost in this vessel when it was wrecked some 230 miles north-east of Sandy Cape, Queensland. In addition to Brown, the "Investigator" carried Ferdinand Bauer as artist, and when Flinders left in the "Porpoise" in 1803, Brown and Bauer elected to stay behind at Port Jackson and wait for their leader to return with another vessel. Fortunately, Brown collected several sets of his specimens, and retained duplicates of those despatched with Flinders in the "Porpoise." Flinders's misfortunes preventing him from returning to Sydney, Brown and Bauer, after a stay of about 18 months, returned to England loaded with specimens and drawings. Bauer's colourful illustrations of Australian plants are now in the British Museum, bound in several large volumes. I was privileged to see these recently, and they are certainly among the finest botanical illustrations of all time. Mr. Ramsbottom, Keeper of the Department of Botany at the British Museum, stated to me it was a pity some Australian man of wealth did not come along and publish the complete set, or at least a selection. Though called "naturalist," and with distinct instructions to collect in all branches of natural history, Brown, so far as we can ascertain, neglected all forms of life other than plants. Of these he fortunately collected several sets of each gathering, with the result that his specimens are now represented not only at the British Museum, but in many cases at Kew, and in various Australian and Continental herbaria. In 1810 appeared the results of Brown's collecting work in Australia in a volume by him entitled "Prodromus Florae Norvae Hollandiae et Insulae van Diemen." It is only a comparatively small work, and the published descriptions are very short. As indicative, however, of the importance of this work to Australian botany, it may be mentioned that it contains descriptions of not less than 113 Orchids, just about one-fourth of the ones known at the present time—not a bad percentage for 130 years ago! Brown left behind much longer MS descriptions, and notes on all his plants, and these, together with his type sheets, are preserved at the British Museum. Both have been removed to the country for safe keeping for the duration of the war.

Lindley: John Lindley, one of the greatest of British botanists, was born at Catton, near Norwich, in 1799, and died at Acton Green, near London, in 1865. He was the author of many botanical works of a general nature, and was founder in 1841 of the "Gardeners' Chronicle," a journal still issued, and regarded by many as the most authoritative journal of its kind in the world. In 1822 Lindley was appointed gardener-assistant secretary of the Royal Horticultural Society of England, and continued in office as Assistant Secretary with the Society till 1858. He was the son of a practical nurseryman, and author of a work, "A Guide to the Orchard and Kitchen Garden." Lindley was reared in an atmosphere of gardening, and continued his love of it all his life. He was the author of "The Theory of Horticulture," which was translated into many languages, and was a favourite of the author's himself, among a prolific output. He was especially interested in Orchids, and, among others, named no less than 45 distinct kinds from Australia—mostly ground Orchids from Western Australia. Lindley's herbarium of Orchids, consisting of mounted sheets, is now at the Royal Botanic Gardens, Kew, England, and is kept in the original cabinets separately from the general Orchid collections in the Herbarium. It has been moved into the country for safe keeping during the war period. Lindley also named a number of other Australian plants, especially many from the interior of Queensland and New South Wales, collected by Sir Thomas Mitchell. These are now preserved at the University of Cambridge, where Lindley's herbarium (other than Orchids) is kept.

Reichenbach: Professor Heinrich Gustav Reichenbach was born in Leipzig in 1823, and died at Hamburg in 1889. He was a worthy successor to the English botanist Lindley as the world's leading authority on Orchids, and one of the greatest Orchidologists of all time. For many years, new Orchids from all lands passed through his hands for naming and describing. His actual contributions to Australian Orchidology were not very great, as he named only about 15 of our species. He was responsible, however, for the naming and describing of many of our showiest kinds common in cultivation, as during his most active period, Orchid-collecting was at its height in tropical countries. At the time of his death, he was Professor and Director of the Botanic Gardens at Hamburg, which position he had held since 1863. His herbarium and collection of drawings were bequeathed to the Imperial Hof Museum at Vienna, under the extraordinary conditions that the collections were to remain in sealed cases and not to be opened until 25 years after his death. In his will, the reason stated was "in order that the inevitable destruction of the costly collection resulting from the present craze for Orchids may be avoided." It seems hard to follow how the craze for the cultivation of Orchids could so affect the Professor's dried collections and drawings, especially when they were under the care of an institution like the Imperial Hof Museum, one of the leading botanical repositories of its day. Reichenbach was brought up in a scientific atmosphere, and when a youth, assisted his father in the preparation of the latter's monumental work, *Icones Florae Germanicae et Helveticae* (Illustrations of the Flora of Germany and Switzerland). He was an accomplished artist, and issued many plates in black and white and in colour of Orchids drawn by himself. He was a keen gardener, and a constant contributor for many years to the "Gardeners' Chronicle," London.

Cunningham: Allan Cunningham was born at Wimbledon, near London, in 1791, and died at Sydney in 1839. Both he and his younger brother, Richard (afterwards killed by blacks on Mitchell's expedition), were assistants to W. Aiton, Director of the Royal Botanic Gardens, Kew. Aiton recommended Allan Cunningham to Sir Joseph Banks as a keen botanist and collector, and he was sent to Brazil, where he spent nearly two years, 1814-1816. Soon after his return to England, he was sent to Australia in a similar capacity. He returned to England in 1831, after nearly five years' botanical and exploratory work in Australia, and settled down at Kew to study his collections. They are preserved in an excellent state at that institution to-day, and some of them, notably those from far north-western Australia, collected on King's survey of the Australian coast, have not been gathered since. In 1831, when Charles Frazer died, the post of Colonial Botanist was offered to Allan Cunningham, who declined it, however, and recommended his brother Richard for the position. The latter was appointed, and on his death in

1835, when the position became vacant again, the offer was renewed to Allan Cunningham, and this time accepted. He arrived at Sydney in February, 1837, but kept the position for less than 12 months, when he suggested that he should be appointed Government Botanist alone, and be relieved of any work in connection with the Botanic Gardens. The reason for this, it is understood, was that he felt too much time was taken up in purely gardening work, the higher Government officers looking to the Botanic Gardens principally as a source of fresh vegetables and cut flowers. When he applied for the post of Government Botanist, he suggested that he should spend considerable time in the field, travelling as far as Tasmania and New Zealand, that he should be given carte-blanche in the work he should do, and that he should receive a salary of £450 a year. These proposals not being accepted by the Government, he left in 1838 for New Zealand, and after a lapse of about six months, returned to Australia in very bad health, and died in a cottage at the Botanic Gardens, Sydney, in 1839. His contributions to Australian Orchidology were not very great, though he gave specimens to Lindley and other botanists to name and describe. He himself named some of our commonest Orchids, e.g., *Dendrobium tetragonum,* the Spider Orchid, and *Dendrobium pugioniforme,* the Dagger Orchid, both common epiphytic species in south-eastern Queensland.

Bentham: George Bentham, who was born at Stoke, near Portsmouth, in 1800, and died at London in 1884, was one of the leading British botanists of all times, and has an extraordinary amount of work to his credit. His principal one is the "Genera Plantarum," written with Sir Joseph Hooker when the latter was Director of Kew, though Hooker always said Bentham was responsible for the greater part of the work. It contains a natural classification of plants, and descriptions of all the then known genera. The Bentham and Hooker system of classification has been supplemented to some extent by more modern ones, but many large herbaria, such as Kew and the British Museum, are arranged for convenience under this system. I say for convenience's sake, for it is a system well-known to most botanists, and they know where to look for specimens in a large collection without having to run continuously to catalogues and indexes. Considering the amount of work Bentham did, he did not name many species, but his analytical mind allowed him to arrange order out of a chaotic mass of material, and it is to him that we owe the first complete account of Australian Orchids, which occupies 129 pages of his "Flora Australiensis." In this work he was helped considerably by the collections and notes of Ferdinand Mueller, Government Botanist of Victoria. Bentham was a man of means, who could have devoted himself to a life of ease and pleasure, but who preferred to spend it in active scientific endeavour. His rule for many years was to work in the Herbarium and Library at the Botanic Gardens, Kew, from ten till four, drive home, and then to spend an hour or two over his notes before dining. A break in this routine was made once a year, when he went abroad or travelled in the British Isles for a month or two.

Mueller: Ferdinand Jakob Heinrich Mueller was born at Rostock, Germany, in 1825, and died at Melbourne, Victoria, in 1896. He arrived in Australia in 1847, and obtained employment as a pharmaceutical chemist at Adelaide. He botanized assiduously around Adelaide and corresponded with fellow botanists in Great Britain and on the Continent. In 1852, on the recommendation of Sir J. D. Hooker, Director of Kew Botanic Gardens, he was appointed Government Botanist of Victoria, a position he held till his death. In 1857 he was appointed in addition Director of the Botanic Gardens, Melbourne, and held the two positions until 1873, when he was succeeded as Director of the Gardens by W. R. Gilfoyle. There has been a good deal of controversy over Mueller's appointment and subsequent retirement from the position of Director of the Gardens, but there can be little doubt in the minds of most that the magnificent collection of Australian and exotic plants that the Melbourne Gardens possess owes most to Ferdinand Mueller. In addition, Mueller was a keen geographer, having done exploratory work in Victoria, Tasmania, Northern Territory, and West Australia. He also helped considerably some well known explorers, notably Giles, Forrest, Tietkins and others. He also helped to raise funds for explorations in New Guinea and Antartica. Mueller was a prolific writer, and with the possible exception of Robert Brown, named more Australian plants than any other botanist. I have not analysed the Australian Flora to see how the two compare, but between them they must share the honours pretty closely. Mueller named and described about 70 species of Australian Orchids. In addition to his own voluminous writings, he assisted George Bentham in the compilation of the "Flora Australiensis," a seven-volume work of which volume 1 appeared in 1863 and volume 7 in 1877. He was showered with honours, both scientific and political, being made an hereditary Baron in 1871 by the King of Wurtenburg, and K.C.M.G. in 1879. The Royal Society of England awarded him a Royal Medal in 1888.

Fitzgerald: Robert Desmond Fitzgerald was born in Ireland in 1830, and died in Sydney in 1892. He was Deputy Surveyor-General of New South Wales, and a keen botanist, devoting most of his spare time to the study of Orchids. He first became known to botanists by his visit with Charles Moore of the Sydney Botanic Gardens to Lord Howe Island in 1869. Previous to this visit the flora of the Island was only very imperfectly known. In 1876 he commenced the publication of his monumental work, "Australian Orchids," for which he prepared all the illustrations and descriptive text, and in many cases, the lithography as well. He was not able to complete it before the end of his life, but it nevertheless stands as one of the finest accounts of the Orchids of any country. There are 92 unpublished drawings of Orchids by Fitzgerald at the Mitchell Library, Sydney, and copies of 5 more have recently been found in the National Herbarium, Botanic Gardens, Sydney. He was first attracted to Orchids by the reading of Darwin's work, and subsequently made many observations on the cross-pollination and hybridization of Orchids in the wilds of Australia. Most of his work was done in New South Wales, but he travelled extensively in Australia in search of material. He is commemorated in the name of one of our most beautiful native Orchids, *Sarcochilus Fitzgeraldi.*

Bailey: Frederick Manson Bailey, for many years Colonial Botanist of Queensland, was born at Hackney, near London, in 1827, and died at Brisbane, Queensland, in 1915. He came of good botanical stock, his father having been a nurseryman and associated with the famous nursery of Loddiges, at that time growing many plants from "New Holland" and the Cape. The Baileys emigrated to South Australia in 1839, where the father, John Bailey, was appointed Government Botanist and formed the first Botanic Gardens on the Torrens River. Unfortunately, although the position had been created, as F. M. Bailey used to say, "the Treasury was empty," and his father was obliged to resign his position, and started farming and nursery work at Adelaide. F. M. Bailey stayed with his father for some years in the business, but left Adelaide and took part in the Victorian gold rush. After a short time in Victoria, he went over to New Zealand, where he was engaged in fruit culture and general agriculture until 1861, when he came to Queensland. He set up business in Brisbane as a seedsman and nurseryman, but in 1875 was appointed botanist to a board appointed by the Queensland Government to inquire into the diseases of plants and live stock in the State. This gave him better facilities for work on Queensland plants than he had before, his previous activities being confined to his spare time. In 1881 he was appointed Colonial Botanist, a position he held till his death, though for the latter years only on half-pay. After the formation of the Commonwealth, when Queensland ceased to be a distinct colony, it was suggested that his title be changed to Government Botanist, but against this, for some reason or other, he always strongly protested, and as Colonial Botanist he was known to the end. He was a prolific writer on Queensland botany, and if he had a special love for any one group of plants over another, it was perhaps the ferns. Thus his first work was "Queensland Ferns," published in 1874; and his only general one on Australia, and not particularly Queensland, was also one on ferns—"The Fern World of Australia," published in 1881. Bailey named and described a number of Queensland Orchids, and in addition gave us the only complete account of Queensland Orchids, which occupies 78 pages of volume 5 of his six-volume work, the "Queensland Flora," volume 5 of which was published in 1902.

I have not mentioned all the botanists who have contributed towards a knowledge of Australian Orchids either by their collections or writings, but have picked out the outstanding ones. At the present time, few general botanists work on Orchids, most of those working on the group dealing with these plants alone, or to a very great extent alone, such as Mr. H. M. R. Rupp and Mrs. C. A. Messmer in New South Wales, Messrs. W. H. Nicholls and E. E. Pescott in Victoria, Dr. R. S. Rogers, the doyen of Australian Orchidology, in South Australia.

● At the October meeting of the Orchid Society of New South Wales Mr. A. A. Robertson of Newcastle was unanimously elected as a Vice-President. Mr. Robertson is an active member of the Newcastle Orchid Circle, and was growing Orchids before either the Circle or the Orchid Society came into existence. The genera *Cattleya*, and *Phalaenopsis* are among some of his fancies.

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Two New Caladenia Records for N.S.W.

Mr. N. A. Wakefield, of the Genoa River State School (Vic.), is a keen botanist, and has been exploring the country on the N.S.W. side of the border as well as the Victorian. Mr. Wakefield's special "line" is Ferns; but he is much interested in Orchids also, and he has now scored two new Orchid records for N.S.W., viz., *Caladenia cardiochila* (Tate), formerly known only in S.A. and Vic., and *C. praecox* (Nicholls), previously collected only in Vic. and Tas. Mr. Wakefield's form of *C. cardiochila* is a particularly interesting one, for it appears to be a quite definite link between Tate's type and Fitzgerald's *C. tesselata,* which was supposed to be endemic in N.S.W. until its discovery a few years ago at Wonthaggi and Yarram in Victoria. The Genoa River plant (to be strictly accurate, the localities are Bens Creek and Timbillica in N.S.W.) has the very broadly cordate labellum (broader than long) of the type *cardiochila,* with the densely-massed, flat-topped calli of *tesselata,* a few stalkless calli extending right to the apex. The labellum has serrulate margins. It now becomes doubtful whether in *C. tesselata* and *C. cardiochila* we really have two distinct species.

Mr. Wakefield's N.S.W. *C. praecox* is a beautiful form of this little species, the flowers being heavily suffused with reddish-purple. I have already mentioned (A.O.R., Sept., 1940, "The Eucaladenias of N.S.W.," sub. *C. testacea*) that in N.S.W. we do not accept Mr. Nicholls's plant as a form of *C. testacea,* but consider it a valid species. We are very glad to welcome it to this State.—H.M.R.R.

● Christmas Cards have been printed, and are now procurable from the Honorary Secretary, Mr. T. H. James, or from Mr. W. Worth, c/o. The Australian Gas Light Co., Pitt St., Sydney. The Orchids illustrated, which are in natural colours, are: *Vanda* x *Herziana, Vanda tricolor,* var. *suavis, Dendrobium nobile,* and *Brassocattleya* x *fabia.* The price is 6d. (sixpence) each.

● Owing to the continued dry weather, red spider is making its appearance in some localities. Plants in the bush house or out in the open are subject to attack particularly. This pest attacks the under side of leaves chiefly, but it may be observed working its mischief on the upper side also. Sponge with soapy water until it disappears.

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The dates of the next meetings of the Society are as follow:—

DEC. WEDNESDAY, 18th JAN. THURSDAY, 30th
FEB. THURSDAY, 27th
at Room 507, Phillip House, Phillip Street, Sydney

Please address all communications regarding the Society to the Hon. Secretary.

Subscriptions for Membership should be forwarded to the Hon. Treasurer. MSS, photographs, and other editorial matter should be addressed to the Hon. Editor.

●

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AUSTRALIAN ORCHID REVIEW

Volume 6 **March, 1941** No. 1

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The author of each article is responsible for the facts and opinions expressed therein

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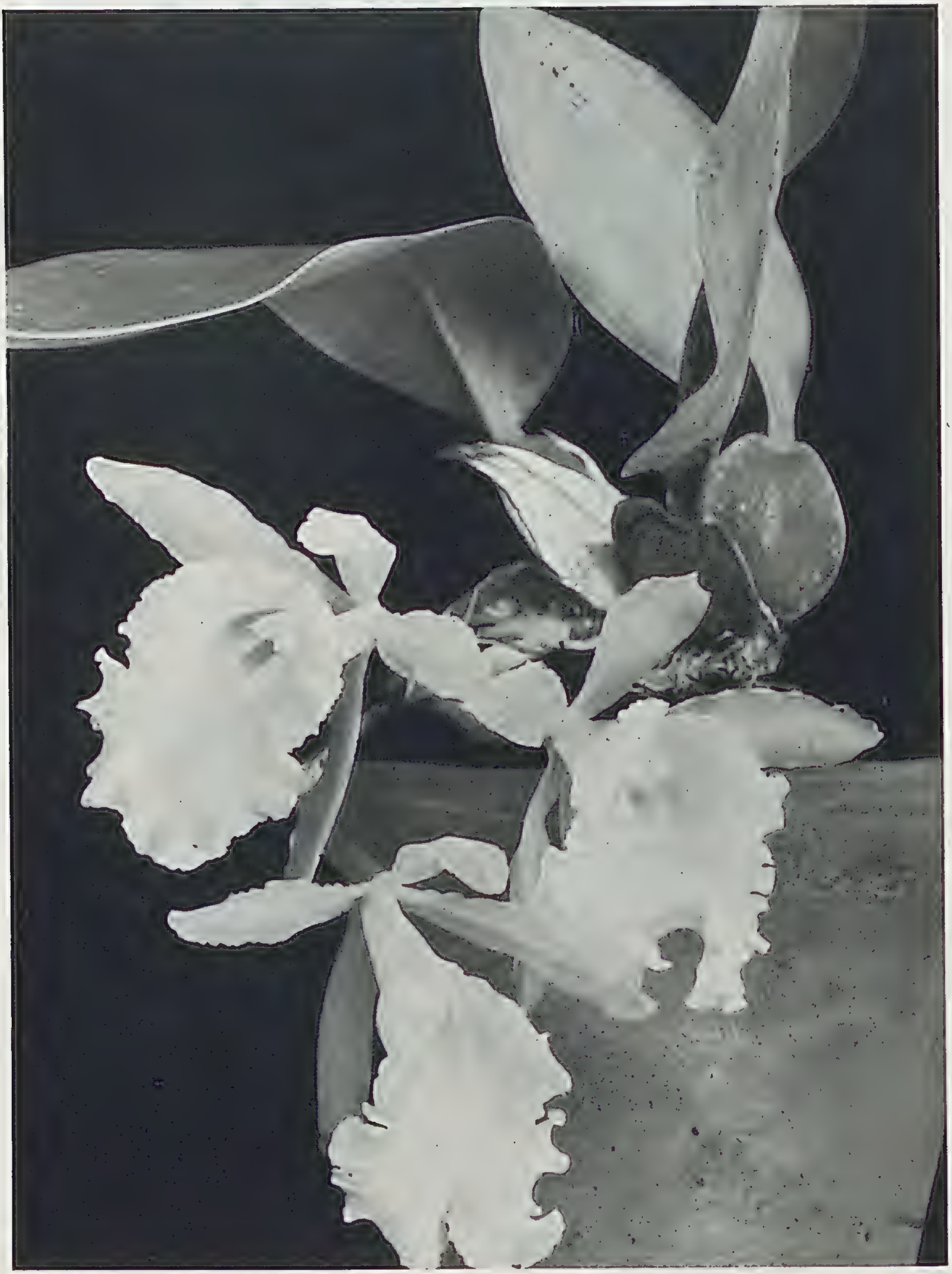


TRICHOPILIA SUAVIS, *Lindl.*

(See article in this issue.)

Photograph by courtesy of The Telegraph Newspaper Co. Ltd., Brisbane

Australian Orchid Review

Editorial

The A.O.R. and Orchidology in 1941

● With this issue, the A.O.R. enters its sixth year of publication. Up till now it has been struggling along to help its numerous subscribers with information on all aspects of Orchidology. Once, early in its career, the A.O.R., while sailing along in financially stormy waters, fell overboard, and, sinking for the third time, a generous friend threw it a financial lifebuoy, which it immediately grasped, saving itself from an early drowning. Since then it has thrown off the effects of the immersion.

This year, 1941, portends to be the most momentous in the history of man. Now we may ask, "Can we keep the A.O.R. going on a satisfactory basis? What will be the position of Orchidology on the eve of 1942?" Usually, the hobbyist is the most optimistic of souls in normal times, but with the European drama staging its most critical act, he cannot help pondering the future.

The first shock of the New Year to overcome is the all-round increase in taxation which strikes heavily, both directly and indirectly. We can expect this to affect the voluntary contribution of photographs to the A.O.R., as the materials of photography have been greatly increased in price due to the incidence of war-time taxation. It depends on the liberality of those Orchid enthusiasts who have any cash in their pockets after the Federal Treasurer has taken what he wants, as to whether the illustrations in the A.O.R. can be kept going or not. A few high-class pictures are required for the June issue.

The recent reduction in the number of pages of letter-press for the A.O.R. is in conformity with the Commonwealth Government's restrictive regulations devised to conserve foreign exchange, and, with huge commitments for war materials to meet, it seems that the restrictions will last for the duration of the war. The greatest reduction in space has been achieved by eliminating illustrations, the letter-press being very little below our usual insertions. Even now the A.O.R. more than favourably compares with similar publications at the same price.

The barbarous destruction of civilian property in England, in the name of war, has included in its depredations the destruction of several Orchid nurseries. Well-known establishments in Belgium and France were the first to suffer, while familiar Orchid nurseries in England have been shattered by bombs exploding nearby. To strengthen the food situation the British Government has been compelled to ask Orchid nurseries to devote a proportion of space to the production of food. Early in 1940, nurserymen were requested to allot at least half their houses for the purpose. Recently the local production of more food was urgently proclaimed, but it cannot be stated what further apportionment of Orchid nurseries may have been for the purpose.

Shipments of Orchids to Australia have been irregular and uncertain in delivery. Some consignments are on the floor of the Atlantic, others have had devious trips, arriving, in some instances, dead, or nearly so. We learn, too, that quantities of pedigree stock have been sent to the U.S.A. for safety, until better days return to England.

Summarizing the position as we know it at present, and surmising that it does not deteriorate in the future, the condition of Orchidology in Australia during 1941 will remain much the same as it was in the closing weeks of 1940. As to the A.O.R., the contributors of the past, and those to be, hold the key to the situation, and by their continued help the outlook for "the cult" should be promising, no matter how depressing the general situation may be at present.

The Genus *Trichopilia*

W. F. ADAMSON, *Bulimba, Q.*

● A very attractive genus of epiphytical Orchids, easy of culture and worthy of inclusion in any collection. There are about fifteen species of *Trichopilia* known, two of which were constituted a separate genus by Lindley under the name *Pilumna.*

The genus is well distinguished by the following floral characters: The sepals and petals are nearly equal and similar, narrow in proportion to their length, and in some species spirally twisted. The lip is always large, more or less funnel-shaped and projecting forward mostly at a right angle to the other portions of the flower; the short claw and small basal lobes adnate to the column. All species of *Trichopilia* are dwarf plants. The pseudo-bulbs are usually crowded and compact, often elongated and nearly flat. The leaves are also small, leathery in texture and dark, dull green in colour. The plants mostly carry from two to five flowers, which are pendulous.

The genus is found growing in a comparatively limited area extending from the Andes of South America to the Equator, north to Caracas, then through Costa Rica, terminating in Southern Mexico.

All the species are epiphytical and are mountain plants. They grow naturally on oak trees where they get plenty of good light and air. Where the light is bad they will not flower and the plants soon fade away. It should be noted that plants have never been found alive in their habitats, where wind and rain have dashed them to the ground.

Here in Brisbane I find that they do well in the glass-house, enjoying the same cultural conditions, including light, as *Cattleyas.* They can be grown in either pots or baskets and should be suspended. The most suitable range of temperature would be from 50° to 70° F. I find that *Trichopilias* do not like temperatures below 50° F., but on the other hand are quite happy during the growing season with the temperature up to 100° F. Here follow brief descriptions of the best known species.

T. coccinea and its var. *crispa.*—A native of Costa Rica, Guatemala.

T. Galeottiana comes from Southern Mexico.

T. Fragrans and its var. *nobilis* is from Colombia.

T. marginata is one of the best, and is found growing on the volcano of Chirique, C. America.

T. suavis (see frontispiece illustration) is a native of Costa Rica. It is found at an altitude of from 5000 to 8000 feet. The flowers of this species are fragrant and the largest of the genus. The sepals and petals are pure white and are slightly undulate. The lip is the main attraction in this beautiful flower. The base is formed over the column like a wide-mouthed funnel; the apical half is spreading and crisped or crinkled. The whole of the lip is white, the apical half having a very prominent band of bright rose-pink spots and blotches, the disk being marked with two deep yellow spots, each about the size of a three-penny bit.

In conclusion, I trust that my notes will create some interest in these beautiful little plants, which are easy to flower. The life-span of the flower is from two to three weeks.

● The cost of producing Orchids from seeds is a considerable one, more for producing the warmer growing *Cattleya* and *Cypripedium* than for the cooler growing *Odontoglossum* and *Cymbidium.* The seeds take approximately a year to ripen from the time fertilization is effected, and anything from four to ten years from the sowing of the seeds until the plants flower. We calculate that it costs a pound or thereabout to produce a *Cattleya* from seed and bring it into flower, so the importance of being wise at the beginning stands out in a clear light. Good Orchid parents may be costly, but suitably matched, and with confidence that the seeds will be raised and grown, they will prove cheap and profitable in the long run.—Black & Flory.

● "*Sale of Plants at Meetings.*—At the October meeting of the Committee the following resolution was passed:—

"Any person desiring to sell plants at meetings shall first obtain the consent of the Committee, and, if granted, such plants *shall not be sold or exposed for sale* until the completion of the business of the meeting. This privilege shall not be extended to non-members."

(Extract from The Queensland Orchid Society's monthly report for November, 1940.)

Vandas and their Culture

J. GORDON SMITH, *Brisbane, Q.*

● When I started to grow Orchids I accepted the theory of the older growers and books, that the best way to grow *Vandas* was to place the plants in pots, putting in as many roots as possible, then to fill the pots to within an inch of the top with crocks, and to finish off with a layer of sphagnum moss. Under this treatment my plants grew and flowered but seemed to lack vitality; leaves soon turned brown and dropped off; long roots appeared and made their way into the compost of other plants.

This started me thinking. Could this method of potting be suitable for our conditions? While sphagnum moss is an excellent medium where humidity and heat can be controlled, as in a heated glass-house, so that it can be kept growing, here in Queensland, where most of us grow our *Vandas* in bush-houses, there is a tendency for sphagnum moss to dry out and perish.

I imported some *Vanda* hybrid seedlings about this time, and they arrived potted in a compost which was new to me. This consisted of 1 part each of pine needles, osmunda, and peat, all chopped up very finely, and thoroughly mixed with 1 part of sifted silver sand. As this compost seemed likely to suit our conditions, a few *Vandas* of the terete type were tried, and so pleasing were the results that a medium-sized plant of *suavis* was then potted in this compost, and its growth showed a marked improvement.

Two plants, a *tricolor* var. *Dodgsonii* and a *suavis*, both of which had a small side growth of equal size, were then selected, and in September, 1939, I removed the *tricolor* and potted it; the growth has been excellent, strong, healthy and free from any blemish. *V. suavis* had, in the meantime, remained on the parent-plant, and, as it had made little or no growth, I removed it last July and already it is showing improvement.

Some may argue that a side growth removed from its parent and potted in a suitable compost will readily grow, but, on the other hand, if the parent is getting sufficient nourishment, then the side growth should make growth in proportion. Considering that the *tricolor* has had only one growing season in this compost, the difference in the two plants is so marked that it appears to me that this compost supplies the necessary requirements for *Vandas*, and having given it two years trial I am of the opinion that it suits my conditions, and produces better growths than does the crock culture.

Given plenty of light, not direct sunlight—only terete *Vandas* can stand such light—a good compost, and kept reasonably damp during the growing season, *Vandas* give an abundance of flowers; in fact, so great is their range that flowers can be had for the greater part of the year, and some of them cover periods when blooms are scarce, such as *Vanda Sanderiana*, which flowers in Brisbane during June, lasting for six to eight weeks in perfection.

Vandas are subject to attacks from a small scale which can be kept down by spraying with 1 teaspoon of "Black Leaf 40" and 3 tablespoons of Alboleum to one gallon of water; if this mixture is used on a dull day in July and December the plants will remain free from this pest.

There are many *Vandas* worthy of inclusion in any Orchid collection, such as *Vanda Sanderiana, Merrillii, Luzonica, coerulea, tricolor, suavis* and *pumila;* then there are terete types such as *teres, teres alba, teres* var. *Andersonii, teres longalabia* and *teres aurora*—the largest of the *teres* group. To-day there are many hybrids to be considered, and we have to thank the late Karl C. W. Schmidt, of Soekaboemi, Java, for many remarkable hybrids, among his best being *E. M. E. Dinger* (*Miss Joaquim* x *tricolor*) and *Gilbert Triboulet* (*coerulea* x *tricolor*).

● ***A Donation to the Queensland Patriotic Fund.***—At the October meeting, the President, Mr. J. Murray Cox, handed a cheque, value £120, to Alderman J. B. Chandler, Lord Mayor of Brisbane and Chairman of the Queensland Patriotic Fund. The cheque represented the proceeds of our Orchid Display and Patriotic Concert held in the Brisbane City Hall in October.

The Lord Mayor thanked members on behalf of the Patriotic Fund for the "magnificent cheque donated by this Society," and expressed the hope that the Society would long continue to prosper and carry on the good work.

(Extract from The Queensland Orchid Society's monthly report for December, 1940.)

A Cultural Calendar

P. A. GILBERT, ***Lakemba, N.S.W.***

● *March.*—These notes are being written while the weather is warm and humid. The showery weather in the coastal areas and around Sydney during December and January has poured its blessings on our Orchids, especially those in the bush-house, while the tenants of the hot-house have been able to receive a goodly portion of rain water where facilities for storing it have been provided. *Cattleyas, Cypripediums, Dendrobiums, Calanthes, Phaius, Cymbidiums* and all native Orchids have responded wonderfully. Orchid growers should experience good growing weather until the end of March, when the days will still be warm, BUT the nights get cooler. During December to early March we could water when we liked and as often as we liked, the nightly temperatures remaining steadily at about 65° F. The arrival of cool nights prompts cautiousness with regard to watering, especially *Cattleyas* and *Dendrobiums,* the end of March being the time to begin hardening off many kinds of these genera. Hardening is acquired by easing up with the watering, chiefly with nightly watering, and submitting the plants to more of the direct autumn sunlight so that it will be equivalent to what the plants have received of the summer sunlight, applying to those who use shading in midsummer. The hardening process will develop hard, plump pseudobulbs, able to carry reasonable crops of flowers.

Some of the Cypripediums will be in flower now, while many flower buds will be well up on the stalks. Others will be encased within their sheaths, and just now these require careful attention. Before they get out of danger, cool to cold nights will have arrived, and to prevent damping off, it will be necessary to see that no water remains in the axils protecting these dormant buds waiting to move at their appointed times. These plants should not suffer from a lack of water, which now is best applied by dipping.

April.—Those who grow *Cattleyas* in an unheated glass-house, that are now about to flower, should move all plants nightly to a drier atmosphere, if humidity is high, or if there is an excess of dampness, as sudden drops in the temperature towards morning will cause the buds to develop spots. This also applies to *Phalaenopsis* and *Miltonias.* April, probably, is the most critical month in the year for Orchid growers in Australia. During this month numerous species will be completing their growths preparatory to a seasonal rest. It is therefore necessary to be extremely watchful at this time of the year with regard to watering. Growers are sometimes caught unawares in early autumn by sudden drops in the temperature, especially at night. Watering should not be as frequent as in the summer months, being safest if carried out in the morning on a rising temperature. In the late autumn it is hardly necessary to water on dull or very cloudy days, as invariably these days are followed by rain or a cold snap. As the nights become colder and the days shorter, so should watering be less frequent. As winter approaches, the water from the tap becomes very cold, making it very risky to use it on many species. Then it is best to use a bucket for dipping pots in up to the rim, the temperature of the water being raised to about 75 degrees by the addition of hot water. All watering from May to August should be carried out in the early morning on bright days, so that by night time pots will have dried out sufficiently to prevent decay or damping off. Avoid overhead watering as much as possible, and particularly so in the glass-house.

May.—With the arrival of May the growing season for nearly all Orchids will have ended. *Cypripediums,* however, will be claiming most of our attention, especially the late flowering kinds, this interesting genus helping to pass away the somewhat dreary days of winter. Repotting of plants that have recently flowered should be held over till the spring, as all potting should cease by the middle of April, unless the grower can maintain a growing atmosphere by artificial heat. At this time of the year the sun has changed his position considerably, which may call for a little shifting around of plants. From now on a little attention can be devoted to cleaning up, repairs, or painting where necessary, getting houses into running order for the spring, when less time is available for those operations. During this month, too, *Cymbidium* flower spikes will be in evidence, and growers of these lovely flowers cannot do better than refer to the copious information to be found on the genus in the pages of this Review.

Cattleyas

GEO. S. RUNDLE, ***Wallsend, N.S.W.***

● Although I have had only six years' experience with these plants I have made quite a study of them in that short time, and on looking back over some of my experiments and treatments I often wonder how some of my plants survived some of the ordeals.

In Australia we must part from the English orthodox ways and means of growing *Cattleyas,* as our climate is so very different. One thing I always try to impress on growers is, that experiments and experience only will make a successful Orchid grower.

I have tried many kinds of potting materials. In some the plants did well for a short time; in others the plants failed from the start. The compost I find best is black todea or osmunda, pulled to pieces and all dirt removed. I prepare all my materials in a sieve so that all the fine materials and dust can fall through. Moss is necessary for healthy growth, and this is used first to keep the body in the compost. Of the two fibres mentioned, I have failed to see any difference. Plants seem to do just as well in either, and the lasting qualities are about equal.

Potting should be done just as the new roots are beginning to push from the last made bulb. The main potting season for *Cattleyas* is from December to May. Do not try to top off with new materials. Completely remove the plant from the pot or basket and cut away all dead roots, or cut back to a healthy base. The plant should then be held under the tap and washed until all traces of old compost are removed. Next fill two-thirds of your pot with crocks, holding a pencil or stick through the drainage hole to ensure a complete drainage system. Place a piece of coarse fibre over this, then begin your potting operations. Potting must be firm; in fact, as hard and as firm as you can get it, working the material from the outside edge and pushing in toward the centre of the pot, but

CATTLEYA x ELBE
A free flowering hybrid.
Grown by Mr. Corrie. Photograph by Dorothy Welding

not downward, as this drags the material away from the rhizome of the plant. Let all loose ends stick up; these can be neatly trimmed off with a pair of shears later. A newly potted plant should be firmly staked, for if the plant moves when the new roots are entering the compost they will be damaged and blacken off. Slugs or slaters are often blamed for this damage. The plants should be completely soaked to settle down the compost, then put aside and kept slightly on the dry side until roots get well into the compost.

Watering is a problem on which no hard and fast rule can be set down, as the different types and climatic conditions of Orchid houses differ. My *Cattleya* house is fairly large, being 36 feet x 18 feet, has concrete benches and so will dry out quicker than a smaller one. Growing plants must not be allowed to become dry, and resting plants must not be over-watered but not allowed to shrivel.

For the past four years I have adopted the night watering in the summer months, with wonderful results. I use the hose very freely over leaves, young growths, compost, etc., until the whole plant is saturated. The plants are then left until they tend to become dry, and are then watered again.

Cattleyas in their native habitats have their leaves, bulbs, etc., soaked in mist and dew every night, and can absorb more during the cool night air than when the sun is shining brightly on the leaves. A few plants should be tried on this method, as the acidity of the water in Sydney may not be the same as Newcastle, where our pH reading is neutral. To simplify matters in watering two divisions should be made, one for resting plants, and one for those that are growing. The resting plants only need looking at once a week, thus saving time.

Cattleyas must be grown individually, as mass treatment will only mean failure.

Ventilators are also very important to keep that humid, buoyant atmosphere so necessary to the wellbeing of our Orchids. Too much ventilation will cause a drying out, and too little a stagnant, musty air. The grower should try to learn to "smell the air," and this is the best method of regulating ventilation. Spraying floors and benches with the hose during hot days helps considerably to keep down thrips, etc., which do not like a very moist atmosphere.

Shading is our next important step to consider. It can be of two kinds, permanent or movable. No doubt we must admit that the lath roller blinds are the finest, but as most of us have some form of occupation which takes us away from home during the day we must find the most suitable of the permanent types. Paint or limewash serve quite well for Australia, as we can always rely on our sun, whereas in England every hour of sunshine is vitally important to the growers there. If either of these types is used it should be stippled on so as to let the pinpoints of clear light through. This year I have covered my clear glass with 1½ inch x ⅜ inch laths spaced ⅝ of an inch apart, and it seems to be quite O.K., but would not like to comment on it until I have tried it for a full season. Of course, my plants receive clear glass all the winter and this helps to ripen up the bulbs for a good start away again in the spring.

These few points are taken from my observations of these plants in the past few years; but every grower must find out the peculiarities of his own particular house and treat his plants accordingly. Once again might I repeat, experience and experiments only can make a successful Orchid grower.

● The exhibits at the November meeting of the O.S. of N.S.W. were unusually interesting. Mr. W. Fahey's *Epidendrum atropurpureum* being an attractive species with a pink labellum and purple sepals and petals. Mr. T. H. James's *Cypripedium Haynaldianum* is a species that is not often seen in flower, neither is *Odontoglossum citrosmum* shown by Judge Markell, his plant being the first to be shown in flower at our meetings. Mr. G. Cruickshank displayed the gem of Dendrobes—*D. Falconeri.* There were many other engaging flowers on show. The exhibits are greatly appreciated by our members, especially the new members who are anxious to know the most desirable species and hybrids to cultivate.

● The man who breeds Orchids becomes a gambler from the day he makes his first seed capsule. He uses his capital and his labour and waits many years, hoping to draw a prize when his plants flower. If he has used first-class parents he is likely to have luck, and will deserve it; but if he breeds from inferior stock he will be unlikely to draw even a compensation prize. Competition is keen and standards are being steadily raised. This raising of standards is what all Orchid growers of experience are aiming at, and the saying that there is always room on the top is nowhere better illustrated than in Orchid raising.—Black & Flory.

Cattleyas in Newcastle District

J. J. GENDERS, ***Stockton, N.S.W.***

● I have been growing *Cattleyas* for about six years, and, in common with most Orchid growers, I have had my successes and failures, and also, unfortunately, made some mistakes. Two years ago my plants were attacked by thrips. I had not before experienced that trouble, and, due to my ignorance, I allowed them to infect all my *Cattleyas*. When I realized the serious nature of the pest, I decided to fumigate with cyanide, doing so twice, with disastrous results. I lost a large portion of my plants.

The fact that my loss was unnecessary and could have been prevented, prompted me, when writing these notes, to warn new growers of the serious damage these insects can do. The older growers mostly know all about them. Their presence is indicated by brown or reddish patches on leaves, from the axil to about half-way up the leaves, and prompt action should be taken as soon as noticed. The thrips can only exist in dry conditions, and if the Orchid House be kept in the moist condition necessary for good growth, they cannot flourish. Regular spraying with nicotine would also be a preventative.

After trying a number of methods of growing *Cattleyas* with varying success, my plants are now really growing well, and should continue to improve both in the size and the vigour of the bulbs and the quality of the flowers. The method I now use for growing *Cattleyas* is detailed in these notes in the hope that it may be of some benefit to those whose plants are not all that they might be.

Potting.—Black todea fibre is used, mixed with a very little green sphagnum moss. The fibre is cleaned of every particle of dust. In fact, the potting material is kept in a sieve during potting operations. All dead or bruised roots are trimmed off and the remaining roots washed clean. Potting is done fairly tightly and a little live sphagnum moss is placed under the rhizome if the roots are in bad condition.

When re-potting is necessary I always choose the time when new roots are just beginning to show. That may be at any period during the year as, on account of the extensive hybridizing, *Cattleyas* make their new growths at varying times. The re-potting of plants in bud or flower makes no difference to the quality of the flowers. I do not break my pots when repotting, as I think it is unnecessary to pot so tightly that it is necessary to break the pots. I use a sharp knife around the pots to release the plants. Cutting roots clean does not seem to harm them.

Light.—I provide all possible light, short of letting the leaves get burnt. Whenever shading is necessary, hessian or battens may be used. Personally I prefer battens. All shade is removed in the winter, except at the western end.

Air.—All the air possible is given, but care is taken to guard against draughts. Bottom vents are level with the pipes; top vents are at the apex of the roof.

Watering.—Watering is done only at nightfall. This is, I consider, the most important part of the whole business, as the plants absorb far more water at night than during the day on a rising temperature, as usually advised. Since watering at night, I have not had one leaf burned by the sun, but previously I had quite a lot affected. Night watering carries a nice atmosphere right through a hot day. I think most growers are afraid of water. I have not drowned any plants yet, but I certainly have starved a lot in earlier years by withholding the water. When I finish watering, the plants really are watered. It is done four or five nights a week, if the weather is hot, but less frequently in cool weather.

The atmosphere in my house is further improved as I have always about 450 super. feet of water in fish ponds. I also do not have any spotting on my flowers, and next year I hope to catch up to Messrs. Robertson and Rundle, two other Newcastle growers. Some growers may be as good, but there is none better than those two. I think Mr. Robertson has nearly a record in one respect. He has flowered constantly every *Cattleya* he has. And still he has not got the best out of them. I will explain what I mean. Until you get a flower scape on a *Cattleya* on which every single bud has developed into a flower, it is not properly grown. This is difficult to explain, but every scape I have seen has another "pip" where a flower should have been, and here in Newcastle we are trying to produce a scape fully flowered. The bulbs are certainly getting longer and stronger, and we often wonder if any one of us has so far grown *cattleyas* as they could be grown.

Since I have watered the *Cattleyas* regularly, and kept the house moist, as it should be, I have had **no thrips**, but plenty of slugs; these, however, are easily controlled.

My Cattleya house is 20 feet x 20 feet and 15 feet high. In the top storey a turkish bath can be had free of charge in the spring or summer while the sun shines. Up to 120° F. is common on a hot day, unless the thermometer registers incorrectly.

● "*Meta Fuel.*—A number of Orchid growers make use of Metaldehyde (usually purchased in tablets and known as Meta Fuel) for the control of slugs. This has always been considered reasonably safe to use, but our attention has been directed to an article in the 'British Medical Journal' in which is recorded a death occurring in a child thirty-three hours after eating one tablet of Meta Fuel. The symptoms were abdominal pain and vomiting followed by convulsions and coma. Since the sale of the tablets is unrestricted, and their appearance is attractive to children, we think it advisable to publish a warning that the tablets should be kept out of reach of little fingers."—Q.O.S. monthly report for December, 1940.

"*Creche and Kindergarten Floral Festival.* An excellent non-competitive exhibit of Orchids in flower was staged in the City Hall, Brisbane, from October 17 to 19, 1940, by a few of our keen members. The display was viewed by many thousands of people and created very favourable interest. We have received a letter from the Secretary of the C. & K. Association expressing appreciation for the exhibit. We thank those members who so kindly gave their time and assistance in making this exhibit possible. In particular we extend grateful thanks to Mr. C. J. O'Keefe and Mr. J. Smolinski for so kindly devoting the three days to caring for the plants."

(Extract from The Queensland Orchid Society's monthly report for November, 1940.)

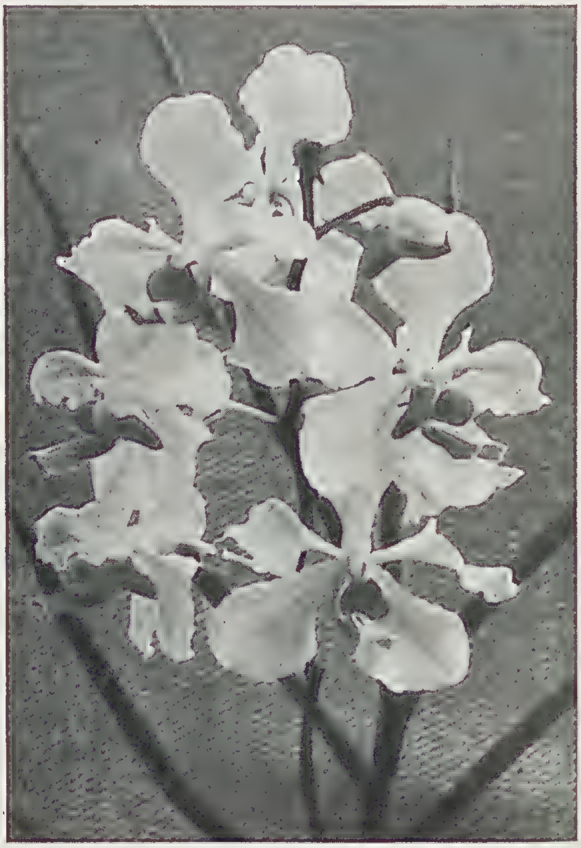
● Taylors', of Belmore, and J. Bisset, of Abbotsford, announce that they have ample stocks of Orchids, both for beginners and advanced growers. Refer to their advertisements in this issue.

● Subscriptions for the Australian Orchid Review are now due. Please post your remittance of 6/- (six shillings) to Box 2582E, G.P.O., Sydney, N.S.W.

● There are still a number of outstanding membership subscriptions to the Orchid Society of New South Wales. The Honorary Treasurer, Mr. G. J. C. Tosi, 39 Martin Place, Sydney, is anxious to have these squared up before the end of the financial year in June. Please help him by posting a remittance in the next mail.

● Mr. T. Harris, of Coolangatta, Qld., kindly sent this note with the photograph of *Vanda* x *Rosalia*:—

"The *Vanda* was grown at the warmest end of an unheated glasshouse, in an 8 inch pot with a compost of polypodium fibre and old hard cow manure, with plenty of crocks and charcoal, the lowest winter temperature being 43° F. Three of the roots, which have been allowed to run wild, found their way into a fishpond below, and now form a tangled mass in the water."



VANDA x ROSALIA

Flowers four inches across, pale rose in colour.

Grown by T. Harris. Photo. by Simpson Bell

Orchid Roots

Dr. CUTHBERT HALL, *Hunters Hill, N.S.W.*

● One does not cultivate Orchids and make a study of their habits for long without realizing how greatly their root action differs from that of other plants. This is mainly because so many species are not ground plants. These live on trees or decaying wood or on rocks covered with decaying vegetation and subject to heavy rains or drenching mountain mists. Because of this the roots must have rapid absorptive power and yet be able to withstand long periods of dryness. Orchids do not have a tap-root such as so many plants possess. Ground Orchids, however, develop ordinary branching roots which usually do not penetrate the soil deeply. They like a thin stratum of soil over rocks to which the roots can gain access and then ramify over. Some species such as *Orchis* develop a tuber which is really several swollen roots combined with short prolongations at the lower end, and this acts as a food storehouse as in the *dahlia* and the *potato.* Lastly there are the aerial roots which characterize the epiphytal or tree Orchids and are of three kinds, viz., (a) clinging roots attaching themselves closely to the substratum, and almost inseparable from it and negatively *heliotropic,* i.e., they seek to grow away from the sun; (b) absorptive roots, branches of the clinging roots, and negatively *geotropic,* i.e., not seeking the ground but growing either up or down and seeking to enter the moisture-laden humus which collects between the plants and the supporting structure, and in the network formed by the new and old clinging roots. In fact, there seems to be a chemical attraction between these roots and moisture irrespective of gravity, and (c) the true aerial roots which in nature especially hang down in long festoons variously branched. In *Cymbidium* and other genera vertical root branches occur which function as respiratory organs. Certain genera such as *Cypripedium* possess root hairs which have a clinging and absorptive function, and one must always take care not to handle these roughly. Most aerial roots of Orchids possess a very important structure known as the *velamen,* and we should examine this in some detail. If a cross section of a *Cattleya* root is examined under the microscope you would first see a single layer of flat overlapping cells known as the *outer layer.* Beneath this are several layers of oval cells which constitute the *velamen.* When moisture is absent these are shrivelled and collapsed, and the root is white and withered, but when water is applied these cells swell with the moisture and the root takes on a plump greenish appearance. Next we observe another single layer of cells, the *ectodermis,* followed by another series several layers in thickness termed the *parenchyma,* and in this are found the *vascular bundles,* corresponding to the veins, arteries, and lymphatics in our bodies, by means of which the circulation of the plant is maintained. In the centre is the *pith.* So it can be seen how moisture containing nutritive material passes through the outer layer to the velamen which soaks it up, then passes it on to the vessels by which it is taken to the rest of the plant, especially the pseudo-bulbs, and stored. Pendent aerial roots of Orchids generally contain more or less chlorophyll, the green colouring matter, so characteristic of the leaves. This can often be readily seen at the *growing point,* which is a bright green. In *Angraecum globulosum* the task of nourishing the plant is performed solely by the aerial roots which are then devoid of a velamen and very much flattened. They are markedly tinged with green, and take the place of the leaves, which lose their green colour and are reduced to scales. So we can now understand why the roots in cultivation endeavour to pass through the compost and attach themselves to the sides of the pot or raft, and then to break up into branches and spread round. We can also comprehend why the growers' manuals advise us not to overpot, as the roots cannot reach the sides of the receptacle, and if the compost is sour or unfavourable they make little or no effort to grow. Similarly, never damage the roots when taking a plant out; break the pot rather and strip off carefully the broken fragments. Many experienced growers refuse to employ wooden rafts because of the damage done to roots that cannot be separated from wood. Besides, rafts hanging near the roof can only be adequately watered, especially in summer, by taking down and soaking in a cask of water, which takes much time and labour. For hanging pots a good plan is to place each in another a size larger with a thin layer of peat moss between, and at the bottom. The walls never become quite dry and the outer pot takes up excess of water, thus saving waste.

Now let us consider what happens when, say, a *Cattleya* is about to make new growth. You will note that there are two buds at the base of the last pseudo-bulb where it springs from the horizontal rhizome. If the last growth has come from a left-sided bud the new one will come from the right and *vice versa*. Occasionally both buds start into action and we get a branching, and a chance soon to divide the plant into two. Along the sides of the rhizome between the two last bulbs, roots will be seen to be starting to shoot, diving into the compost, seeking the sides of the pot, or spreading over the surface and running down the outside. Now is the time to damp down freely, especially if rain water is available. As the roots progress the bud elongates, and produces the new pseudo-bulb. If the chosen bud or growth is destroyed the other takes its place. The new roots are soft and easily damaged, and especial care must be taken of the pointed tip, which is readily broken off and such root is then done for. This is the time when pests such as slugs, slaters, etc., must be especially kept away, and exterminated. For this reason it is better to keep the rhizome down well on to the compost, or even half covered, to save the roots from attack. After being an enthusiast for green sphagnum moss for surfacing I have discarded this to a great extent and prefer peat moss mixed with a small handful of the needles of our forest oak, *Casuarina torulosa,* cut into 2 inch lengths. In nature decaying leaves constitute mainly the humus on which Orchids thrive, and these *casuarina* needles, which do not develop fungus, certainly, when mixed with peat moss, encourage most healthy root growth. Failing this, a fair sized piece of sphagnum moss may be packed under the advancing rhizome, or a few pieces of the closely felted roots of the reed-like swamp grass to be found in our Blue Mountain swamps. If the peat moss is washed away, more may be added. If this is done, very little or no ordinary sphagnum may be added, especially if the brown todea is used, which lasts quite well, holds moisture better, and is much preferred by Orchid roots, especially if a one-inch layer is placed over the crocks at the bottom. Too much green moss on the surface tends to keep the pot overdamp, and if allowed to dry out and then watered again, mildew frequently appears and sourness develops.

The Orchid pot with slits in the sides, in my experience, gives the best results. You can't overwater it, and root growth is the healthiest, also plants so grown flower more freely.

Now a word of warning. About an inch up the pseudo-bulb occasionally in hybrids a pair of extra buds will be found. These will grow and flower in preference to the normal pair on the rhizome, but the new growths coming from the former fail to give roots or those that do come seem to fade out and so the plant eventually perishes. So these misplaced buds growing up the pseudo-bulb should be completely cut away as soon as observed.

Finally, in view of the uncertain water position in Sydney and elsewhere in Australia at present, let me urge everyone who can to put down one or more tanks to conserve all the rain water possible. The most experienced growers are enthusiasts as to the benefit to Orchids from using rain water. In Sydney we are to get a considerable proportion of Warragamba water. If this is disinfected by bubbling chlorine gas through, most or all of the gas may evaporate away. But, if chloride of lime is used by direct contact, I do not see how we can avoid having dissolved lime left in the water. In any case, the drainage from Jenolan and Wombeyan Caves, and their surrounding limestone formations, runs into the Warragamba River, so it must have a considerable lime content.

● Wherever exhibitions are held, and however small and inferior they may be, they will be instructive and inspiring, and an increasingly higher standard will emerge through emulation, and through the years that are yet to come.—Black & Flory.

● When Orchids are imported directly from overseas, or purchased from dealers who have recently imported them, they should be thoroughly examined for scale, yellow thrips, etc. Cut all dead or decaying parts from each plant, rubbing slacked lime into the wound.

● ***The Sale of Orchid Plants*** at meetings has been informally discussed by some of the members of the Orchid Society of New South Wales also. One member suggested that if sales were made the Society should deduct a percentage for the privilege, 10 per cent. being mentioned.

● At the December Meeting, Mr. W. Palmer exhibited, for the first time, *Oncidium Lanceanum,* a handsome, fragrant and distinct species from Guiana, Central America.

Recording Orchid Plants

C. O. DUNN, *Brisbane, Q.*

● Orchids appeal differently to different persons. With some it is the colour, others the quaint and varied shapes, whilst it must be confessed that some are attracted only by the apparent costliness, the reputed rareness, or the glamour attached to the word "Orchid." The appeal again varies with the age and condition of the patient. Thus the bride-elect is more likely to be attacked by the disease just after the banns are published than at any other time. Generally the latter attack is very severe, but of extremely short duration. Some persons maintain "the plant's the thing," and delight in well grown plants of any species, whilst a minority, yet an important one, is attracted by the scientific side. Hence the difficulty of producing a paper that will appeal to all. However, I hope that most sections of Orchid lovers will find something of interest in that which follows.

Records. — Have you ever considered how essential records are in this so-called civilized world of ours—how they have existed almost from time immemorial, even prior to the days of Moses, who caused the people of Israel to be numbered. Right back to earliest man, who also kept records, and protected them from the weather by choosing for his purpose caves, using various pigments to outline the shape of his hands. According to the book "They Wrote on Clay" (By Edward Chiera), "In 2,000 B.C. the law required that even the smallest business transactions should be in writing and duly 'signed' by the contracting parties and the witnesses. Each man carried his signature around his neck. This was in the shape of a little cylinder of stone engraved with scenes from religious or social life. When the document was ready, each party and witness would roll his cylinder over the wet clay, and the imprint which came out in relief served as his signature." Then further on in the same book: "The Babylonians played a large part in laying the foundations of our sciences. From the beginning of the second millenium B.C. they carefully catalogued and classified everything that came under their observation, and this body of information was passed on to be reorganized or revised by the generations following.

Three thousand years later we come to that ambitious sample of British records, the famous Doomsday book — and so through the ages records have been kept, even up to this very day when almost our every action is tabulated and recorded. Records of our births, our marriages, our divorces, and our deaths. Records for the State electoral roll, for the Federal roll, or for jury service. Records of our dogs, records of our motors, records of our convictions for speeding, to the other extreme, for not speeding by parking too long in one place. Records that we wish could be forgotten. Records of this, records of that—even such a simple thing as a tram journey is recorded and tabulated. Of what use are records? Are they overdone? Perhaps they are, but nevertheless some are essential to progress, for the human mind forgets most things. Probably 99 per cent. or even more of what we see and hear is eventually forgotten. This power of forgetting is really a good thing in disguise; it enables us to forget our sorrows and unhappiness, whilst remembering our joys and contentment.

Any record which assists us to appreciate or to get better results from our plants is worth consideration. The present way of showing the breeding of hybrids uses vertical and horizontal lines. (See Appendix "A.") This will, I think, eventually be succeeded by the new diagrammatic chart consisting of circles and radiating lines, which I have pleasure in introducing. (See Appendix "B.") I am indebted to Captain A. E. T. Payne, of the Yarraview Guernsey stud at Lilydale, Vic., for the germ of the idea. He uses a chart of similar principle for the recording of individuals and their butter fat production, whereas the essential difference is that we use it for recording species and hybrids, and not individuals.

In no section of the horticultural world will this change prove its usefulness as in the orchidaceous section. In other sections, floral progress is chiefly along the lines of selection, and reselection, with a view to improvement and fixation of characteristics. The Orchid breeders, on the other hand, are mainly seeking improvement along different lines, namely hybridizing, and then re-crossing the progeny of different crosses. I wonder if greater progress could not be made by carefully selecting two individuals outstanding in colour, size, or habits of the one species or hybrid as parents. A successful instance of this breeding and selection within the species is Sir Jeremiah Colman's collection of *Lycaste Skinneri*, some startling plants having been raised by crossing the varieties of *Lycaste Skinneri* together, and from the seedlings scarcely two appear alike. (A.O.R., March, 1939, P. 10.)

Of what use is the chart? Has it any advantages over the older method? Both old and new charts are designed to show the pedigree of the modern hybrid, but I think the radiating chart gives a better visual idea of the species used in breeding, and the proportions of each ancestor at a glance. This is useful inasmuch as indicating a hybrid is more likely to succeed under certain conditions due to a preponderence of a particular ancestor.

For instance, *Cymbidium grandiflorum* is definitely a cool grower. (A.O.R., March, 1939, p. 20.) *C. Insigne* likes a little extra heat, being subjected to strong sunlight at one period and to almost flood conditions at another. (A.O.R., March, 1939, p. 19.) On the other hand, *C. Lowianum* when given more heat and more moisture than it required, flower spikes were very few and far between. (A.O.R., March, 1939, p. 19.) *C. Huttonii* requires humidity even during the winter, but that will not worry us, for I cannot trace the species having been used as a parent. (Cultural Table, Murray Cox.)

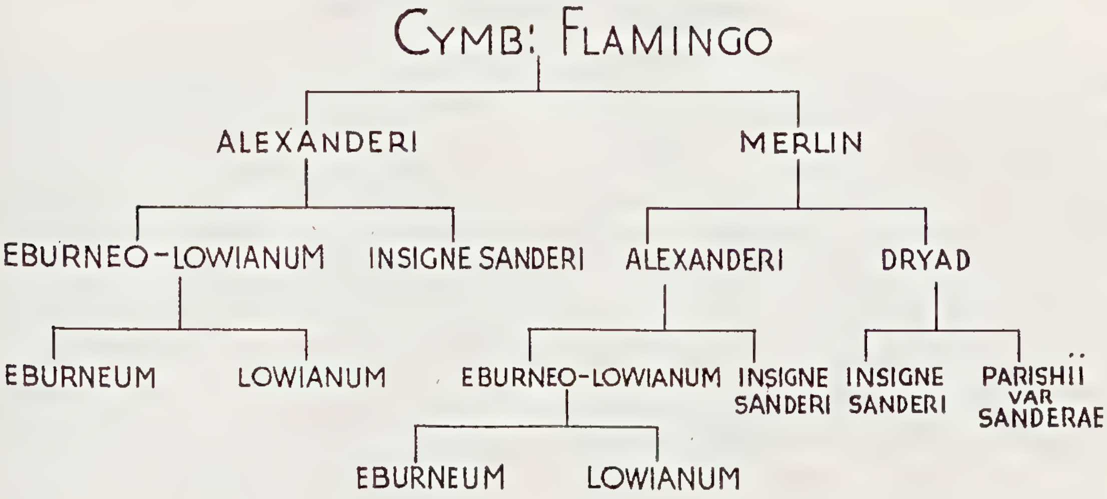
If a hybrid is not succeeding with you, whereas others growing under identical conditions are, perhaps the fault lies with certain characteristics handed down by a particular ancestor, and an examination of the chart may possibly suggest that you try a variation of your growing conditions; a little more heat, or a cooler spot, more fibre or more loam, etc. Now I do not claim that if you take so many parts of one, so many of another with a dash of a third, you will get the same result every time, for you will not. The characters of each parent are not handed down equally to each offspring. Many of the characters are recessive, and only re-appear under suitable conditions, whilst others are lost. Each new sexual union would produce new combinations, and the offspring would become exceedingly variable.

A contributor to the first number of the A.O.R., p. 15, writes: "So many crosses have been made, and so many seedlings have been raised and flowered successfully, that the naming and re-classifying of the seedlings has become almost bewildering. It was somewhat of a task when *Cattleyas* were crossed with *Cattleyas,* and so on through the other species, to keep a record of the names given to the resultant seedlings, but with *Cattleyas* crossed with *Laelias, Brassavolas, Sophronitis, Epidendrums,* and the seedlings upon flowering being again crossed and recrossed, the problem becomes almost a crossword puzzle." That may have been so in 1936, but the radiating chart simplifies the puzzle. For instance, the multigeneric hybrid, *Potinara Ruby,* raised by Stuart Low in 1934 consists of five species of *Cattleya* and one each *Brassavola, Laelia* and *Sophronitis,* and each step in the breeding could be clearly shown in a chart similar to "B."

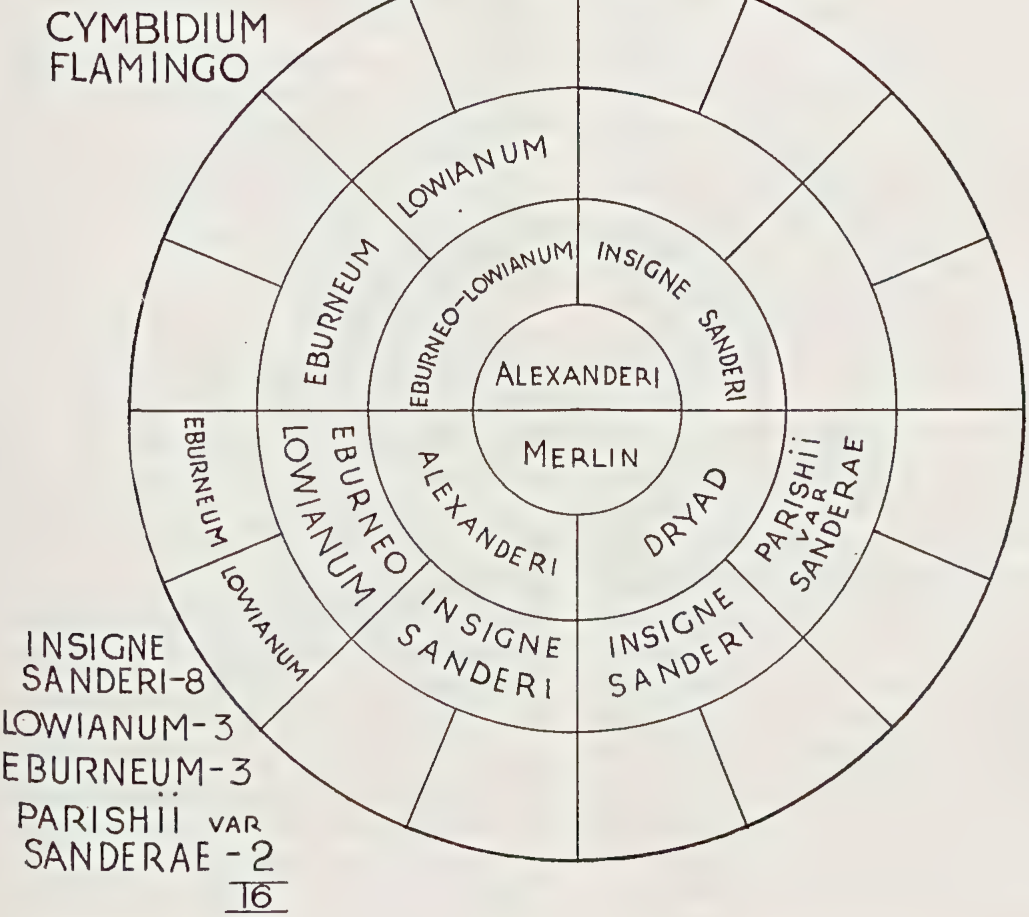
I suggest you construct a chart of your favourite plants, so borrow from the library Sanders Hybrid Orchid lists, and work out the parents yourself. It gives the plants more individuality, and may help you to better cultivation. It's fun, anyway.

PHALAENOPSIS SCHILLERIANA
The subject of an article in the previous issue.
Grown and photographed by S, Mills

A.



B.



INSIGNE SANDERI-8
LOWIANUM-3
EBURNEUM-3
PARISHII VAR SANDERAE - 2
16

Peat — Peat Moss — Moss Litter

F. DOUGLAS, *Mosman, N.S.W.*

● *Peat* is the name given to a decayed vegetable compost obtained in Russia, Germany, Denmark and the British Isles. It is dug out from the bogs, marshes, swamps, or morass in the form of a wet, sloppy brick, and, after being laid out, exposed and dried, is used as a fuel. In fact, in certain districts of Germany, Denmark, Ireland, Scotland and the Shetland Islands it is the principal domestic fuel.

It is supposed to be organic matter in a condition primary to being coal, and is usually found, as with coal, in layers or strata at varying depths in feet. Peat from different moors is for practical purposes accepted as being similar in nature, but no doubt specifically and scientifically are quite distinct and dissimilar. Peat and the soil overlying it are extremely sour and brackish, the impervious nature of the peat making drainage a difficult and uneconomical problem.

Nurserymen and gardeners north of the line avoid its incorporation in the soil, but exploit it when making or sealing a pond, moat or bog garden. Practically every model garden at flower shows, exhibitions, etc., is composed of it in the fresh and plastic state. It solves any difficulty of making embankments and contours, while the moisture content is ideal for retaining that freshness in the lawns, flowers and plants for the duration of the show, notwithstanding that its acid content may alter the colour of the flowers. In three days all the blue cornflowers turn pink, and in three weeks pink Hydrangea turns blue.

The Germans exploit and emphasize its value most, but not in their gardens. Perhaps its characteristics may be best explained by relating that at many horticultural shows they have a class, a competition, with awards to those keeping fruit or vegetables in a natural state for the longest period in a usable condition. The prize has frequently been awarded to apples which had been packed in peat for at least three years.

Peat Moss is the name given to the circumscribed locality overlying peat, or where peats are obtained. Generally speaking, it is an infertile region but not necessarily barren, because it is, where not covered with water, carrying a vegetation of heather, heaths, lichens, moss, rushes and other bog plants.

In most peat mosses there are substrata of peats in different states or stages of decomposition. It frequently overlies the water table and is insufficiently compact or condensed to make a peat, consequently it is, or rather was, of no value. In Great Britain it is seldom more than a few inches deep, but in the German moss it varies from one to six feet deep. Naturally, it has to be thrown out in order to obtain the underlying peat, so it becomes a litter on the moss, and *moss litter* is the descriptive title.

Moss Litter.—After being exposed and thoroughly dried by the wind it is of an open and soft texture, while it is also extremely light in weight, both characteristics making it suitable as packing for bulbs, machinery, etc. It is also frequently used as a sound-deadener in buildings, the space between floor boards and ceiling and the cavity between stair tread and lining boards being filled with it. It is used in enormous quantities as a substitute for straw bedding for horses and cattle. European gardeners do not use it or consider it as a soil improver.

The peat moss sold in Australia to make gardens blossom, is the moss litter of the old world. Great difficulty was experienced in successfully cultivating many acid-loving plants in the eastern seaboard of the United States of America until it was discovered that the inclusion of some of the packing in the potting mixture supplied the missing link.

In Australia it appears to be supplanting the green moss. Apparently the excessive exposure which it has undergone reduces its pH value to near neutral, and, if it is not generally beneficial, at least it is not harmful, as all plants can be grown in a neutral medium, even if their optimum growth is reached only in an acid or alkali.

It is submitted that it is a very useful ingredient to have at hand in the nursery, garden or potting bench. The benefit is not confined to topping up soil for seed or seedlings; to incorporating in a humus-lacking soil or as a necessary adjunct to Orchid growing. And don't *Cymbidiums, Cypripediums, Epidendrums* and a few *Dendrobes* respond to its application.

It may be mentioned here that the peat referred to by overseas writers in Orchid cultivation is nothing like it, except that it is of a peaty nature. It is usually composed of the roots of grass, heather, bracken, etc., obtained from the surface of the moors. This is very

(*Continued on page* 18)

A Hunt for Phalaenopsis Rosenstromii

A. GLINDEMAN, ***Brisbane, Q.***

● As we closed the gate behind the packhorses, the sun was just peeping over the rim of the hills; the breeze, crisp as only a mountain breeze can be, fanned our faces, and we swung down the rolling, grassy slopes at a steady walk. Crossing Micheal Creek, we ran along a wide alluvial flat. The grass here was eaten down to a luxuriant carpet by cattle coming to water. Up the flat to the foothills we rode, driving the packhorses before us, and after a short climb found oureselves on top of a high divide, incidentally the divide between coastal and Burdekin waters.

Looking back we could see Mt. Fox standing like a gigantic haystack on the surrounding plateau. The track lay along the divide through open forests, in some places rendered bare by timber-getters.

By noon the sun was hot, and the breeze had dropped. We had begun a gradual descent to Quartpot Creek, where we boiled the billy, and dined on corned beef and damper. Rough granite spurs ran down from the divide from this point onward, and though the track stuck to fairly level country along the crest of the range, it was nevertheless a stony one. This type of travelling is always hard on the feet of unshod horses. For this reason we were thankful that ours were well seasoned to this sort of going. The climax of all this rugged country is the "dropover," which we reached at sundown. Labouring up a steep ridge one minute, the next Hidden Valley lay a thousand feet below us, spread in a marvellous panorama and walled in by precipitous mountains, with the Running River cutting it with a silver ribbon, as it winds its way to join the Burdekin eight miles below Hell's Gates.

We pulled the packsaddles off the horses in readiness for the climb out in the morning. Lighting a fire, we had our evening meal of more corned beef, etc., unrolled our swags under the stars, and, lulled by the musical tinkle of horse-bells, went to sleep. It may be here added that very few bushmen suffer from insomnia, the percentage of bachelors being greater here than in town.

Up early in the morning, we had our breakfast over before daylight, and by the hour of eight had mustered and packed our horses and started off up the valley to the top of the range. Here we passed through the rain forest belt—thick oak and patches of jungle. Many kinds of Orchids were seen during this day's ride. One species of Orchid that was plentiful was *Dendrobium gracilicaule*. We also noticed plants of *Dendrobium Adae*, a slender bulbed plant with a small flower which smells like an orange blossom. Considerable numbers of *Dendrobium fusiforme* were growing on the forest oak trees. Almost every kind of Orchid adorns the branches of these forest oaks. On top of the range there are huge trees with trunks as straight as gun barrels; many of them are six feet or more in diameter. Here we noticed five plants of *Dendrobium agrostophyllum;* this plant bears a pretty yellow flower from the nodes in twos or threes. I have found it difficult to grow.

About midday we commenced the descent of the range. It was a beautiful clear day. You could observe the sea with the Palm Islands dotted therein, in the distance, and many cane farms showing a light green against a darker green. This was truly a magnificent sight. The packers' track is very rough, for it is many years since the packers used it for packing goods to the tin mines, and tin back to town, occasionally used by a traveller to or from Hidden Valley to the coast country.

After travelling through forest and jungle and descending about two thousand feet, you come to a swift running stream which bears the name of Flagstone Creek. Here you may see, after a good deal of hunting through the jungles, a stray plant or two of *Phalaenopsis Rosenstromii.* I have noticed that the plants from this locality are usually of large size. The forests have been denuded, and you are lucky if you can find a plant.

Here we said good-bye to corned beef, as game was plentiful. Although we were unsuccessful in our Orchid hunt, we had good hunting with rifle and gun. We spent two days plant and game hunting. We bagged sufficient turkeys and other game to make corned beef a distant memory. We also bagged a nice little wild pig.

After our hunt here, we packed our camp and shifted to the bottom of the range. We travelled to a small township called Bambaroo, on the main coast railway line. After leaving Bambaroo, we travelled back to the foot of the range again and pitched our camp. The following day we commenced our Orchid hunting once more. We spent two weeks here roaming the jungle mountain sides, over precipitous granite spurs following the courses of swift running streams, down gorges and ravines, ever on the alert for plants of *P. Rosenstromii.* Some days we would not find a single plant; on others we would find quite a lot. One day we found thirteen plants. Quite a remarkable feat, this was our best day's hunting.

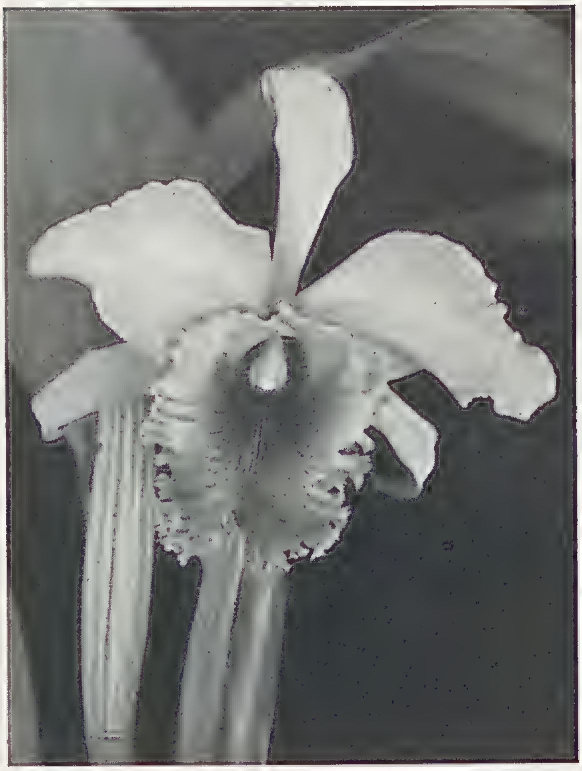
You find *Phalaenopsis* growing on almost every kind of jungle tree, and also find them on granite boulders. One good host is a low growing fig tree. This particular tree has spreading branches and open foliage. It is quite common to find several plants attached to this type of tree. Another species of Orchid that is very plentiful in this country is *Dendrobium undulatum.* This plant grows anywhere and everywhere, on large trees, small trees, and rocks. In this country there are huge granite boulders strewn through the jungles. On these rocks, Orchids and ferns grow in profusion. Many of these rocks had lovely tassel ferns growing on them.

The rare *Dendrobium Keffordii* also grows on the rocks here. We saw several plants of this species while we were hunting. Another rare Orchid we saw was the *Anoectochilus* or Jewel Orchid, very small but very pretty, a gem of the Orchid world. This country is the only place where I have seen it growing.

Game is plentiful here also. We could always bag enough turkeys, etc., to keep up our food supply. In the streams there are very nice fish called mountain trout. They certainly resemble trout in habit and appearance, very shy and hard to catch on lines. Only on rare occasions will they bite. We fished quite a lot with fine gut lines, but only on two occasions were we successful. We caught three fish the first day, and eleven the second, the largest of our fish weighing three pounds. They are beautiful eating.

On this coast country snakes are very plentiful. You see them every day, small ones from only one foot long to huge pythons over twenty feet in length—many colours and many shapes, thick ones and thin ones. Many of the species are non-venomous. The only two venomous kinds we noticed were the black and brown snakes. The big sleepy pythons are non-venomous. You get quite a thrill when you almost walk on one while you are gazing about the trees for Orchids.

After our Orchid-hunting was over, we packed our plants and sent them to Brisbane. This business over, we packed up our horses and travelled back to Mount Fox, taking the same route on our return.



BRASSOCATTLEYA x MIRABILIS

Flowers 8 inches across. Segments light yellow, lip lilac with yellow veinings. A beautiful hybrid.
Grown and photographed by F. Th. J. Nyland, Bandoeng, Java

Peat - Peat Moss - Moss Litter

(*Continued from page* 16)

plentiful in England, although there is very little peat and few peat mosses.

Occasionally we hear of Tasmanian peat, staghorn peat and fern peat, and it really does get confusing to one who has not seen or worked with them.

The soil or silt of Holland is classified as peat mould or simply peaty, due to an appearance of peat-like material in its texture, smell and composition with a decidedly acid reaction.

As all the world knows, it is extremely suitable, and is exploited for the cultivation of all plants which resent a lime in the soil, such as most bulbs, Azaleas, heathers, heaths, Kalmias, Luculias, Rhododendrons, Daphne, and certain fodder grasses.

● Editorial matter, MSS., and photographs for publication should be sent direct to the Hon. Editor. The address is printed on the back cover.

Cool House Culture and Notes for Amateurs

T. H. JAMES, ***Longueville, N.S.W.***

● Autumn is, I believe, a most important period in all plant life, including Orchids, because the treatment they receive during that period has a very considerable influence on their growth and flowering, in the following spring and summer. The term usually applied to this autumn treatment in "hardening off." The term is fairly expressive, but conveys no practical indication of the methods that should be adopted.

I suppose there is no form of plant life which presents so many problems or occasions its devotees so many heart-burnings as Orchids. This is due largely to the extraordinary range of their habitats with their widely differing climatic conditions. The majority of Orchid growers cultivate, or endeavour to do so, many genera in the one house, and the fact that they frequently achieve a fair measure of success shows the wonderful adaptability of the Orchid, coupled, of course, with the skill and patience of the grower. Even with a house devoted entirely to *Cattleyas* the native conditions of the various species could not be reproduced.

Cattleyas. Most of these will have finished their growth. Many will have flowered. Others have buds developing and some, like *Cattleya Trianae,* will not flower until late winter or spring.

Where the growth and flowering has finished, or where flowers will not open until spring, give the plants a complete rest by giving less water, but never allow them to become **quite dry,** for more than a few days, to prevent shrivelling of the bulbs. If flower bulbs are developing, keep the water going until the buds just open, and then give the plants cooler conditions. These remarks about watering apply, of course, only to warm sunny conditions. If the weather is cold or wet, do not water unless necessary.

Those who have small or moderate collections and are prepared to give the time involved, *Cattleyas* would benefit from open air and sunlight during our typical autumn sunny days. The whole plant would harden and reserve more energy for spring action. A slight yellowing of foliage would be an asset. In fact, I believe the plants should at all times receive enough light to induce that condition. In my experience, deep green foliage will not result in much flower, certainly not consistent flowering.

On my own house the paint was nearly all washed off before summer began, and it is nearly quite clear now. Over it I have very light and open scrim blinds. These were purchased in August, 1939, and treated with Mr. Slade's preservative. The fibre was certainly preserved, but not against the mating instincts of numerous birds which we have encouraged by providing plenty of food. They have not reciprocated, but I suppose their education is not sufficiently advanced to suggest the stripping of someone else's blinds and not mine. The tops and bottoms are now mere shreds. A large portion of my roof is therefore practically clear glass and the hottest days so far have not burned any foliage. A reason, possibly, is that my house is saturated with water. It has an earthen floor thickly covered with Begonias and ferns, while moss is growing on many of the benches. In addition, there is a tank of water. After reading about American houses watering their *Cattleyas* in the evening I adopted the practice as soon as growth started. My house is very open and the plants are potted in fibre only—ordinary Australian todea, not osmunda. Consequently, watering only in the morning—as advised by text books—my plants generally did not respond as they should have. Under my conditions they have been dry by mid-day, remaining thirsty all night. I believe that it is a mistake to assume that an atmosphere heavily charged with moisture will offset dryness in the pot. Watering in the evening reduces that result. The plants, including the foliage, are damp all night and well into the next day, thus giving them an opportunity to absorb that large amount of water to which the copious rains of their native habitats have accustomed them. The results with me have been astonishing. This is typical of several of my *Cattleyas* at the time of writing these notes—the end of January. *Cattleya* x *Stoneyware* the leading bulb longer and more than twice as thick as the good flowering bulb previously made. The flower buds are one inch high in the sheath. The leading bulb is now shooting again in two places, the bulb behind is shooting, and two back bulbs are also shooting well, after partial division. *B.C. Pauline* is acting similarly, and has two sheaths so far. Another *Cattleya* finished flowering on two bulbs three weeks ago. Both leads are again shooting, one in two places, and six back bulbs also. The new growths are already three inches high. In practically every case the growth is a big improvement on that of last year. One growth is already twelve inches high and not nearly finished, the previous growth being five inches. Almost every plant at a flowering age has either flowered or is in sheath.

From watching results over a number of years I find pots more satisfactory than baskets, and open-sided pots better than the ordinary type. I also enlarge the bottom hole very much.

The second growth in a season may sometimes be detrimental, but not when it is made early in summer to give it ample time to mature. Another thing I noticed—generally the plants in pots suspended up close to the glass have done better than those on a high shelf, possibly due to the suspended plants getting more aeration than those standing on a shelf which would block the free passage of air through the pot.

Dendrobiums. These are receiving the same treatment as the *Cattleyas,* although most of them are in a bush-house. It is too early to determine the final results, but present indications point to excellent results, many bulbs having produced two, and in some cases, three bulbs. These should now receive more light; in fact, after March direct sunlight would assist that hardening process, but **do not allow** them to become quite dry. *Dendrobium Findleyanum* which, in the past, was a complete failure with me, is for the first time making good bulbs.

Cymbidiums. A number of these, such as *C. Traceyanum* and *C. giganteum* and some early hybrids will be showing their flower spikes. Keep the water going on these, and liquid manure could also be given up to the time the buds are ready to burst. Others should, I think, be kept a little on the dry side to encourage flower buds. Plenty of sunlight from now on will induce better flowering. Slightly yellowed foliage will not be harmful, rather the contrary.

The Queensland Meteorologist, Mr. I. Jones, has promised particularly heavy rain during March, and if that eventuates I shall place most of my pots of *Cymbidiums* on their sides to prevent overwatering at this stage.

Cypripediums. Most of these will now be in bud, and that is the only time when overhead watering will need discretion. I would not water over the foliage in the evening for fear of rotting the buds. There will, however, be little danger of that once the flower stems appear. To simplify watering the plants could be re-grouped, separating those in bud from the remainder.

Oncidiums. I have grown O. *flexuosum* for four years, and it continues to grow well. It now has twenty leads. O. *varicosum* var. *Rogersii* and O. *aurosum* I have had for two years now, and they continue to improve and are again in bud. *O. flexuosum* is on a hard fibre block, and the others are in pots on pure fibre. I have now obtained O. *papilio* and placed it on a piece of tree fern. It is doing well. I had a plant of *O. lanceanum* for several years in a basket. It just existed. In fact, it went down-hill. Some months ago I placed it on a piece of tree fern. It is now sending up about eight new growths and rooting well. A good feature of these blocks and tree fern butts is the impossibility of overwatering. The fibre remains moist and open to the air without being really wet. These plants require plenty of light.

Miltonias. The hybrids with me are a complete failure. I have tried many methods but without success, and for the present have given up trying. I have a species, however, *M. spectabile,* which grows like a weed. It grew well in past years, but this year, with the evening watering, it has excelled. It has now six strong leads, all of which are in bud. It is growing on a hard fibre block with a little moss, and is suspended on the shady side of the house about three feet from the roof. I am endeavouring to obtain some of the other species, which should do as well.

Vandas. *V. tricolor* has not recovered from the excessive watering received two winters ago, and an examination showed that all the roots inside the pots were dead. They have been repotted and show signs of improvement, but I cannot claim they have been a success under cool conditions, although they have flowered moderately. *V. suavis* seems a bit hardier and is doing better. I have seen a number of *Vandas* recently, including some excellent specimens grown by Mr. Webb of Granville, which are planted in fine sphagnum moss which is partly replaced occasionally. The hybrid *Vandas* which grow and flower so luxuriantly for Sir Harry Moxham at Rose Bay are in moss only, and I think it would be impossible to grow finer plants. The terete *Vandas* must, however, be grown behind clear glass facing the sun. *V. teres*—my treatment of this species in the past, by

Meanderings of a Mug

"H.W."

● The appeal of our Honorary Editor for contributions touched a responsive chord in my breast. Why should not I show them how to do it? So blame the Editor, not me, for this effusion.

About three years ago, my attention was called to some beautiful and curious flowers in a florist's shop, which attracted me immensely. My knowledge was sufficient to know that they were Orchids, but the genera I could not name. A little later I was induced to attend an Orchid Show, and there were displayed the beauties of the flower shop, and, better still, named—they were *Cymbidiums*. Having a good knowledge of *C. suave*, of which I had seen hundreds, my amazement, as you can imagine, was vast. It was incomprehensible. Enquiring the price of one that attracted me, I was told £10. That raised my hair, and respect, for the ware (poetry). Strolling around, another shock awaited me. "Outdoor grown" met my eye. This was a stunning blow, as my mind carried the idea that Orchids had to be grown in a fiery furnace.

Whilst thinking the matter over, an advertisement met my eye offering *Cymbidium* species at four shillings. This was too good to miss, and off I went and bought 2 dozen plants, all in four inch pots. The seller was hazy as to the species, thought they were *Lowianum*, though what *Lowianum* was I had only a faint idea. On delivery the plants were inspected, revealing the fact that there were 2 bulbs and three or four leaves in each 4 inch pot. They were potted in what looked like sand and charcoal, and when turned out of the pots no roots were visible. The lot were dumped in a corner under a grape vine whilst work proceeded on a bush-house. This was a pretentious affair of 2,000 square feet, and was planned out with the idea of being as natural as possible. Winding paths were dug out to various depths and widths, the earth thrown up in mounds, and 15 tons of sandstone floaters were used to line the sides of paths, and to scatter over the surface.

No benches, no brickwork or cement, or anything not natural to the bush was allowed inside. Old stumps, butts of old tree ferns were scattered about, and it was planned to get rid of all pots by using hollow logs, though this last is taking time, as such are very scarce. One enthusiast told me he had tried the logs and they split. This latter I found was true, excepting in a few instances, but why bother—it gives good drainage—and if the crack is so wide as to let out the compost, plug it up with old staghorn.

Whilst building the house a friend presented me with half a dozen of what were evidently *Dendrobiums*. The labels could not be read, but one word, *Johannis*, was decipherable. This entailed the buying of something to grow them in. Two shillings secured a mixture of some fibre and moss guaranteed to grow Orchids. The plants were planted in a shady rockery getting, perhaps, 2 hours sun a day, and in pockets formed by stones, whilst work went on with the bush-house. This was finished on Christmas Day, 1938, and attention was turned to the *Cymbidiums*, in their shelter, which had been left to take care of themselves. They had made good growth and roots were coming through the bottoms of the pots. Three, however, had suffered through being eaten by rats; every leaf

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planting in a compost that contained soil (it is planted in the ground in Singapore) was a failure. They flourished for a time, but in winter the roots died out. I now have it growing on a piece of tree fern stump with plenty of live moss. It is under clear glass and has just finished flowering on five nice sprays.

Lycastes. These are still growing vigorously. Keep the water going. Sometimes they flower in early winter. Watch for flower buds, and when they appear move the moss away from the buds for fear of damping them off.

Thunias. The leaves will soon start to yellow, and then no further watering is required. Some suspend their plants in a shed, but I prefer to turn the pots on their sides under the shade of a tree where the atmospheric moisture can be absorbed.

Coelogyne cristata will shortly be showing its flower spikes. As the bulbs develop they may, on the short rhizome variety, become so massed that flower spikes may have difficulty in emerging. In such a case, I would suggest cutting out some of the bulbs, but be careful not to sever the rhizome. I usually have to cut out about 40 bulbs each year. *Coelogyne Massangeana* grows equally as well as *C. cristata* with me.

was gone and even the bulbs chewed over. Later it was found they had been dumped on a rat's nest.

The next problem was repotting. What to do? Meandering around, I got into contact with some experts and, after listening to various ideas, they were finally put into equal parts of hard cow manure and leaf mould, mixed with broken crocks,, and a third of the pot first filled with crocks. Attention was then turned to the *Dendrobium* in the rockery. Four of the six were dead and dry. Pulling them out, not a root had been made, a nasty rotting soggy mess prevented any growth. Another looked as if it had a chance, but died later; the survivor was put in the bush-house on a heap of broken sandstone and leaf mould, and covered over. It took a long while to recover, but to-day is alive and healthy and producing what to me seems aerial plants, the roots crawling all over the stone.

Returning to the *Cymbidiums.* They were scattered about the bush-house beds on sandy soil, and in May were through the pots again, and to my delight two flower spikes showed, and on flowering were *Lowianum.* The compost not meeting with my approval—it sinks down too much in a month or two, and could not be packed around the roots owing to the large pieces of cow manure—a mixture of cow manure 2 (old and rotted), leaf mould 2, tan bark 1, crushed bones 1, with some broken stones to keep it open, was used. Only one crock was used over the drainage hole, to economize space. When the flower shoots appeared my enthusiasm can be imagined. Had been told they would not flower for two years at least. Did not this prove without a doubt that I was the most accomplished Orchid grower in Australia? Forthwith an order was sent to England for about 60 plants, both seedlings and named varieties. These arrived in late August in not too good condition, dozens of dead leaves, though only two were without any. Some pots being broken afforded me an opportunity to examine the compost, and to my horror and amazement it turned out to be cocoanut fibre or some such rubbish. The poor things had been starved. Three pages of instructions came with them. All were ignored and the opposite was done. Repotted in the four-fold compost, at Christmas they were through the pots.

Again repotted, they once again (June) showed through the pot holes. Two are in flower, including a 800 guinea cross; of the first batch of 2 dozen, ten are in flower, one champion in a ten inch pot has three spikes, one with 23 flowers, and badly wants repotting.

Those not flowering are suspected to be *grandiflorum,* which have the reputation of flowering about once in ten years in our coastal climate. At least, so I am informed.

Whilst the house was being built an order was sent to India for species. They arrived in March, 1939, in a dreadful condition. No leaves at all except on *eburneum.* They were planted in hollow logs and all made a good recovery, though none has flowered this year. When the first flowers appeared and I realised how clever I was, nothing must do but to try my hand at something difficult.

Meandering along, I asked for the "hardest to grow" Orchid and was handed *Dendrobium Parishii.* Whether this is so or not, others will know better than I. It was planted on the same old heap of broken sandstone and leaf mould. Shortly it flowered and thereafter made a shoot twice as thick as any it had in its natural habitat. There we will leave it, with its roots spreading all over the rocks. *D. nobile* was treated the same way, flowered well and made several new shoots. *D. thyrsiflorum* was elevated on a split log with the same method of potting. It is doing well also.

What puzzles me is the fearful enthusiasm displayed by writers of articles for studying the natural habitats of Orchids in order to find out the best methods of growing them. After showing to their own and everyone else's satisfaction that certain species grow on the tops of trees exposed to sun and wind, they—

(1st) Pot them in polypodium, todea, sphagnum, etc., and wax enthusiastic over one or other. Now I ask myself, "Did any Orchid ever grow naturally in any of these?"

(2nd) Why, after showing that they grow exposed to every breeze, put them in a stuffy glass-house, and write pages about ventilation?

(3rd) Why, after proving they grow exposed to sun, write more pages about the best method of shading?

(4th) Watering. More pages about humidity, coke, sphagnum as an aridity indicator, etc., *ad nauseum.* Still more pages about spots, etc., due to under or over-watering. What is the matter with rain and the hose?

What is worrying me is the cost of pots, allied to the fact that they are unnatural, but one can hardly put a log weighing 100 pounds on the show bench, and I aspire to that honour one day.

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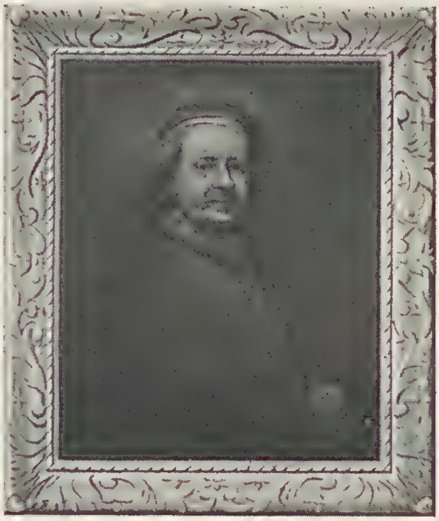

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AUSTRALIAN ORCHID REVIEW

Volume 6 June, 1941 No. 2

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The author of each article is responsible for the facts and opinions expressed therein

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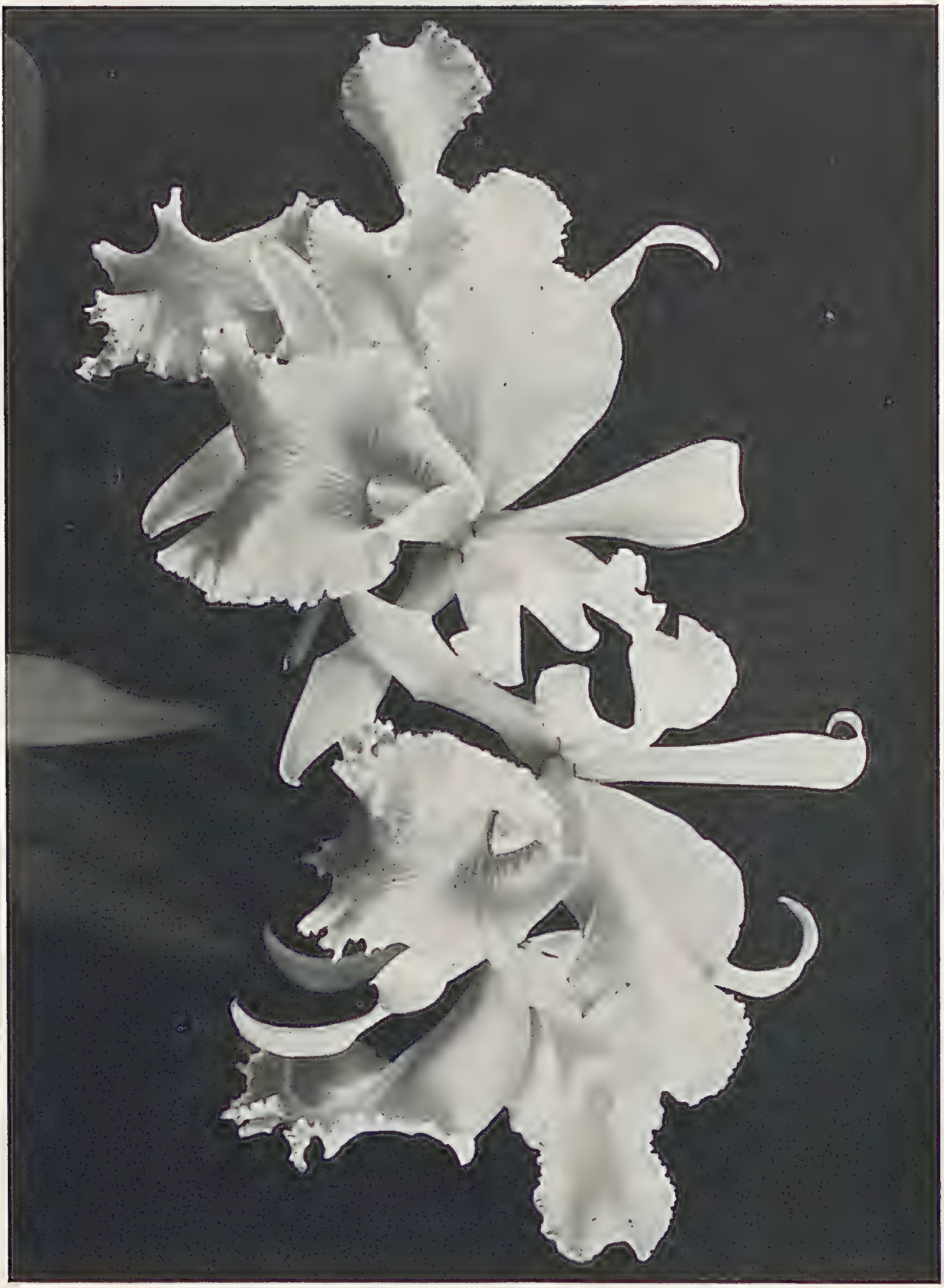

CATTLEYA "JUDGE MARKELL"

(C. *Fabia, alba, Marie de Waverin, x C. Maggie Raphael, alba, rubra.*)
Grown from seed by Mr. W. Schmidt. Photo by Dorothy Coleman Studios, Brisbane.

Australian Orchid Review

Editorial

Factors in Orchid Culture

● The numerous factors which enter into the cultivation of Orchids under artificial conditions, are ample to supply themes for articles in the Australian Orchid Review, and any one factor can be made a subject of interest and value to growers.

To attain the perfect cultivation of Orchids the grower must be conversant with all the factors that go to bring about perfection, and the following factors enumerated are some of many which experienced growers could exert their faculties on for the benefit of the novice or beginner.

Structure: Owing to the fact that the structure of an Orchid flower is a specialization, certain botanical facts must be known to enable the grower to get the full pleasure from his hobby. ***Distribution:*** Thus, to obtain the greatest amount of benefit from his plants the horticulturist should know a little about Botany in general.

Light: What do we really know about our light? What amount of light is necessary for this or that species? What is the difference between the actinic values of a mid-summer's sun and that of mid-winter? And what are the relative values of diffused light resulting from the use of paint and canvas blinds; checkered light admitted through lath roller blinds, coarse hessian, tea-tree, or other means of producing a mixture of sunlight and shade; and full sunlight falling directly on plants or through clear glass?

Watering: A very important operation, of which we are all desirous of discovering the correct application. ***Humidity:*** How to create it; is high humidity more beneficial at night than throughout the day? ***Ventilation:*** Top and bottom; when to apply each or both; the most advantageous positions to fix ventilators in a house. Importance of good ***Drainage.***

Elevation and Position: Topographically as well as the influence of these important factors in the house itself. As no two Orchideries are identical in every respect, contributors would help greatly by describing briefly the general features of their houses. A grower at sea level and near the water may have entirely different results with a species, to those of a grower living ten miles inland at an attitude of 500 feet—both using the same general methods.

Potting different species and their hybrids. ***Repotting:*** when should this operation take place? ***Over-potting:*** its influence on the development of a plant. Which species like it? What species abhor it? ***Potting Materials:*** the most suitable for epiphytes and terrestrials. ***Cultivation:*** the species that thrive best in pots, baskets or other means of mounting; general treatment during the growing season, and the resting season when it applies; the treatment of newly-imported Orchids; the care of plants about to flower. ***Heating:*** various systems; types of houses for special or general use.

Insect Pests: how to eradicate thrips, red spider, ants, scale, cockroaches; how to control slugs, snails, slaters, etc. ***Black Rot*** and ***Damping Off:*** whether due to degeneration, wrong treatment, or infection by bacterial or fungoid diseases. ***Bud Shedding:*** its cause and prevention.

Propagation: the pollination of flowers for seed; the production of aerial growths for future plants, and the species that produce them; handling back pseudo-bulbs and other means of inducing vegetative multiplication. ***Overstocking:*** under what conditions is it permissible to prevent loss of plants or flowers.

Habitats: a knowledge of these of many species is essential, saving needless effort and loss; *Phaius grandifolius,* for instance, is a species mainly growing in damp or wet places at low altitudes near the coast north of Newcastle, New South Wales. It is therefore apparent that this species will thrive better at sea level near the coast than at a high altitude, and in a drier climate inland.

In this issue an exhaustive paper appears on the "Symbiotic and Non-symbiotic Propagation of Orchid Seed," while an important paper on the subject "Light" will appear in the September issue. A comprehensive series of articles such as these, on the various factors of Orchid culture would considerably enhance the value of this Review as a work of reference, the contributors receiving the gratitude of all keen growers.

Cultural Notes for Queensland

J. MURRAY COX, *Brisbane, Q.*

June

● The winter months in Brisbane leave very little actual cultural work for the Orchid grower. Our *Dendrobiums* are resting after the completion of their summer growth, and are maturing their new pseudo-bulbs in readiness for the spring flowering. They will need but a minimum of water—just enough to keep the stems "fat." They will require all the light they can have, and the direct sunlight of winter will do them no harm. The maturing process is chemical in its action, and the motive power is sunlight. Winter flowering *Cattleyas* should have the buds showing in the sheaths during this month. Care must be taken with watering these plants—if too much liquid is given them the compost will not dry out by night time, with consequent risk of a sudden severe drop in temperature which may lead to fungoid or black spot trouble, or may weaken the plant's resistance to any virus disease which may be inherent in it. Spring and summer flowering *Cattleyas* should be resting and will require only sufficient water to keep their pseudo-bulbs from shrivelling.

Cymbidiums should be kept moving. Like *Vandas* and *Cypripediums*, the plants of this genus have a less defined resting period than *Dendrobiums* or *Cattleyas*. Morning watering seems to suit them in Brisbane during the winter months. The early flowering species such as *Tracyanum, grandiflorum* and *giganteum* should either be in flower, or should have their buds well developed. The scapes of the hybrids should also be making their appearance in anticipation of their early spring flowering.

Any plants which look as if they will need re-potting before the spring should be dealt with at once. But wherever possible it is better to carry them over until the new growth is showing.

The winter period is the time to get your potting materials in order for the spring. See that you have stocks of fibre, leafmould, etc., get it teased out and cleaned ready for use. Look into your stock of pots—clean up and sterilize any that have been used previously. See that you have a stock of suitable stakes on hand. Attend to the labelling of your plants, and write up your record book if you keep one. All these things, if attended to during the slack season, will give you a good beginning for the new seasonal growth.

July

Those who live within the frost areas will need to keep a careful eye on the weather. Although a touch of frost will do no harm to the Andean species of *Cattleyas* or *Coelogyne cristata*, and some of the *Pleiones*, it is not beneficial to the majority of Orchids. Plants grown under glass are safe enough, but the open type of bush house favoured by many growers here renders plants somewhat liable to frostbite. This can be avoided by placing a "dunce's cap" of a white or transparent paper over each delicate plant—or by simply covering the plants with sheets of paper at dusk. Quite a satisfactory temporary substitute for a glass roof can be provided by gumming two or three thicknesses of white cellophane together. This will serve to keep out frost and all but the heaviest rain.

Watering should be at its lowest quantity for the year. A dip in tepid tank water about once in three weeks should be all that is necessary. In the case of plants coming into flower, of course, rather more will be necessary, but care should be taken that any watering should be done on a clear bright sunny morning.

Slugs are generally prevalent during July, and they seem to have a particular liking for *Cymbidium* buds. Metafuel (metaldehyde) seems to be the best means of dealing with these pests—while a small piece of cotton wadding tied round the flower scape will serve to checkmate them.

August

I regard August as the most critical month in the year for the Brisbane Orchid grower. Warm sunny days are often followed with severe frosts—heavy rain is followed by a cold snap. Plants are started into growth and then suddenly checked. Care must be taken to minimize these changes in weather conditions as much as possible. Dry westerlies are also frequent, and these dry out the compost and tend to cause the pseudo-bulbs to shrivel. When a dry westerly blows a daily spraying of leaves and compost is beneficial. A dip in tank water (after taking off the chill) once a fortnight should meet normal water requirements. As new growth starts, any plants that need re-potting may be dealt with —in fact, it is a good plan to make a careful examination of all your composts during this month. A plant will do much better if it starts its growth cycle in a good clean fresh compost than if it has to make do with a soured or soggy one.

Early spring-flowering *Dendrobiums* should be in flower, while the later ones should have their buds well developed.

Hybrid *Cymbidiums* are in full bloom, while *Vanda tricolor* is usually filling the air with fragrance. Liquid manuring may be started in a mild way with plants which have commenced their growths.

Orchid beetles and slugs are the worst pests in August, while the warm days tend to favour the activities of scale insects. Start the year well by spraying all plants with an emulsion of soap, red oil and nicotine sulphate. This should give your collection a clean start.

Throughout this monthly period there is little difference in the temperature range, of which the low overage is 41°, while the average maximum is 75° F. In June there are more days which reach the low margin than in July or August, while in August there are, of course, a greater number of days which exceed the average maximum, but during every month there is the risk of a sudden drop after a temporary rise in the thermometer. The average rainfall is just over 2 inches per month—with August showing a tendency to an occasional violent thunderstorm. I do not make any claim to weather prophecy, but I have an idea that the winter will set in early this year and will be rather a severe one.

● ***Queensland Orchid Society Office Bearers for 1941.*** The following gentlemen were elected to office for the current year, at the annual general meeting held on February 14:—President: Mr. V. W. A. Moller. Vice-Presidents (Metropolitan): Messrs. A. P. Blair, L. F. Hayes and L. C. Home; (Country): A. Wilkie (Cairns), Alex. Grant (Mackay) and T. Harris (Coolangatta). Hon. Secretary: T. C. Harveyson. Hon. Treasurer: J. R. Tanner. Hon. Technical Adviser: C. T. White. Hon. Auditor: Allen W. Higgins. Committee: Dr. D. A. Herbert, Messrs. C. A. Hilsden, H. Jamieson, S. H. Phillips, J. Gordon Smith, J. Smolinski, Fred E. Todd and H. E. Young.

● Subscriptions for the Australian Orchid Review are now due. Please post your remittance of 6/- (six shillings) to Box 2582E, G.P.O., Sydney, N.S.W. Several subscribers are in arrears. The terms are "payment in advance."

● Mr. Keith Williams, of 15 McAlister Street, Ipswich, Qld., writes (3/3/'41): "At the present time I have numbers of plants of *Dendrobium Phalaenopsis* coming into bloom, and some of the plants have shown a tendency to drop their flowers. The buds are well developed, and open fully one at the time. By the time the second bud is opening the first flower has already wilted and soon drops. This takes place within a day or two and continues the length of the spray. A friend of mine has had this trouble two years in succession, and I have had a few other cases brought under my notice. The plants are all well grown on blocks of wood, and show good healthy root action. From all outward appearances there is nothing about the growth of the plant which would seem to indicate the cause. The plants receive almost full sunlight all the year, and have previously done well in the same positions.

Various treatments, such as retarding the water, shading, dipping in lime water to reduce any acidity, have all been tried without avail.

The loss of flowers has only taken place on plants that have been growing out of doors in an open sunny bush house which receives the various prevailing breezes excepting westerlies.

Others that have been grown in a bush house that is sheltered on all sides, and having a "brush" top do not show this tendency to drop flowers up to the present time. I am experimenting with a plant taken out of this house by placing it in full sunlight, hanging under a small tree. If you could obtain any information on the subject I would be more than pleased to have it. The flowers show no sign of making seed pods or of having been fertilized."

Any grower who has information to impart that will prevent the defect mentioned by Mr. Williams, it will be appreciated by growers as the species behaves similarly around Sydney. Perhaps the southern climate does not always act submissively to this dendrobe, our variable autumn weather, at times, lacking something which it receives in its much warmer habitat of North Queensland.—Hon. Ed.

● ***Vanda teres.*** "The compost I use for growing *Vandas*—and this is what *teres* is planted in—is good fibrous elkhorn roots mixed with large lumps of mature cowdung, and topped with sphagnum moss. The pot is about half filled with broken crocks and charcoal for drainage." — R. E. RIDGWAY, Southport, Qld., 28/3/1941.

Cattleyas—Observations and Suggestions

F. A. WEINTHAL, *Roseville, N.S.W.*

● Be under no misapprehension, I don't regard my plants as 100 per cent. nor anything near it, and I'm quite aware that some growers might consider them only middling; at times even I have thought them to be less than that. Whatever they are, they have improved recently from what they had become a couple of years back. This article in the main refers to *Cattleyas* and similar sorts. It is not an attempt to lay down cultural rules or directions, but is merely an endeavour to give hope to some growers who, like myself, were, or are at times, sorely troubled and perplexed as to why their plants are not doing better. This position may not be appreciated by some growers whose plants are of comparatively recent importation, and have perhaps arrived full of vigour in their pots. Being placed in their new quarters undisturbed they, in due season, bloom beyond expectation to the great satisfaction of the new owner, who then rather prides himself on his success and feels that he can give a few points to some of the older hands. When, however, re-potting is necessary, and as the result of disturbing the plant the following season's flowers are not nearly as plentiful, the grower will probably recast his estimate of his own capabilities in Orchid culture. By the way, I have been told by a local trade grower that re-potting should make no difference whatever to the next season's growths or flowering if done at the correct time, and with the proper material. To be quite candid, I don't believe this, although it may come off all right on some occasions. There is a mighty gap between the progressive growing of the professionals overseas, and that of our locals, amateur and otherwise. Well, I digress, but will now return to my original object. When the plants do not look as well as they should; not so many flowers as formerly; new shoots start off in good style but do not keep up their promise; not so many healthy roots, or they rot when in compost, what's the trouble? There may be many, but deterioration of potting material can reasonably be suspected. Understand I have no brief for any particular fibre, as may be seen from my short article in the September, 1939 (Vol. 4, No. 3) issue of the Review. We are likely to forget that the best potting fibre will not last many years, and I say this notwithstanding the claim for certain fibres by some who want to sell them. To start, select a plant not doing well and examine the compost. The top may look all right, but under the surface it is probably decayed and sour, perhaps reduced almost to mud in spots. Remove part of the compost and wash out the bad stuff; a reasonably strong force of water is suggested. If what then remains is still hard and fibrous, firmly fill in the spaces with fresh potting material. The next growth should show progress provided some roots have remained. If all the compost is sour or decayed, remove all of it, wash the plant and re-pot with new material; I had to do the latter with a big percentage of my plants. Although this operation took some weeks and used up many sacks of fibre I did not regret it. The season following the operation did not show immediate results in all cases, but in the next, however, decided improvement was evident.

In passing, it might be as well to mention that excessive watering often has a quickly deteriorating effect on the potting material, and consequently on the health of the plants. This, no doubt, is more likely to occur with inferior potting material or such as has been in use for some time. Some growers maintain that if the compost contains no sphagnum moss, but only a topping of such moss, that water may be applied plentifully with no ill effects; this is quite likely. There are others who strongly advocate rain water as the only water for Orchids, and state that tap water, on account of the purifying treatment to which it is subjected, has a definite detrimental effect on epiphytes in the course of a couple of years. This may be so, but many quite good plants are grown for very long periods in apparent health, only tap water being available. Rain water is no doubt good if obtainable, but is its use really vital? However, we are all entitled to our pet theories or delusions; they keep us interested and happy. Notwithstanding the use of tap water I have recently had several decided "come-backs" in respect of old plants which had deteriorated to a considerable extent; rightly or otherwise, this is attributed to re-potting in fresh clean compost last year.

Let the atmosphere of the house be as freely charged with moisture as you are able, for that suits the plants, but have your ventilation sufficient to avoid stagnation as much as possible. Another matter to be considered is light. With not sufficient of this essential item, the growths may appear to be quite good and look well, as also the foliage, but there is a striking scarcity of flowers. The amount of light to be allowed is entirely in relation to the position and aspect of the house, but a good rule to adopt is, I think, to allow as much light as possible consistent with non-burning of foliage. I've seen some houses in exposed positions in which the foliage will burn at times although the glass is painted or whitewashed—that is, when the shading wears in spots. On the other hand, in my own house, which is low and long with brick walls up to a clear glass roof sloping down towards the north-west and fitted with lath blinds to be rolled up in dull weather (battens 1¼ inches, spaces ¾ inches) or for the most of the day during the winter months, very little burning results, although a yellowing of foliage is noticeable at times. Factors making necessary the more liberal provision for light through my roof are, firstly, brick walls up to a roof sloping in one direction and, secondly, a neighbour's tree. Some branches of this latter cast a shadow over part of the roof for portion of the day. Since the fixed battens formerly on my roof were discarded in favour of those that roll up, the increase in number of blooms has been noticeable. If the foliage of your plants has been grown overseas or in a heavily shaded house, don't apply more light too suddenly—say, start early in winter—or a big loss of leaves might result. The change may be accompanied by a certain amount of this in any case, but it will be mainly the older leaves. A season or two will correct this inclination as the foliage produced under the lighter conditions will stand up to a lot of sunlight, which in turn will induce the production of more blooms, and that seems to be what we are after. Another suggestion is to handle the plants often and periodically. Constant spraying with an insecticide may keep them clean on the front; the back, however, which is not always available to the direct action of the spray, has also to be remembered. A periodical look over and attention to the back with a brush and some liquid insect spray, or even soap and water, will do a lot to keep the plant free from disease.

These are not suggestions for new or original treatment. I am aware that some growers with different methods may get a greater proportion of flowers to the number of plants than I do. To conclude, if your plants are doing well, continue your present treatment; if not, then the above remarks may assist a little.

VANDA TERES
Grown by R. E. Ridgeway. Photo by G. Hart.

● ***The Frontispiece.*** "I am sending a print of *Cattleya* x *Judge Markell.* My plant was raised from seed by Mr. W. Schmidt some years ago, which he presented to me on June 30, 1939. At that date he said it was about eight years old. Last year it made a sheath which damped off, so I was more careful this year. The plant flowered on January 20, 1941. The flower is certainly very beautiful. The sepals and petals are pure white in colour, the tip of the labellum is blotched with maroon, the throat being orange-yellow."—T. C. HARVEYSON, Hon. Secretary, Q.O.S.

● At the February meeting of the Orchid Society of N.S.W., the Hon. Secretary mentioned that some of his *Cattleyas* had sheaths with flower buds showing and new growths had started from the bases of the flowering bulbs. A member stated that, in his experience, he had never known *Cattleyas,* in such circumstances, to mature their flowers, and requested that progress be reported at the following meeting. The Hon. Secretary reported that the flower buds and new bulbs on the *Cattleyas* in question continued to grow rapidly and, about March 20, the flower buds had emerged from the sheaths and, in two cases, the new bulbs also had sheaths.

● Editorial matter, MSS., and photographs for publication should be sent direct to the Hon. Editor. The address is printed on the back cover.

Cool House Culture and Notes for Amateurs

T. H. JAMES, *Longueville, N.S.W.*

● June, July, and August, are the three most difficult months for those Orchid growers with either bush houses or unheated glass houses. Our winters are generally rather pleasant, and without those extremes of cold experienced in other climes, and even if there are frosts the sun after 9 a.m. has considerable warmth. On the other hand, those months can be very unpleasant with long spells of cold wet weather. The main consideration during the cold months is to keep as much of the cold southerly and westerly winds from the plants as possible. With this provision, and assuming that the pots are amply drained, there should be little danger. One of my problems is the preservation of flowers which open in the winter. The cold wet conditions sometimes cause spotting of flowers, to avoid which I transfer the plants to a glassed-in warm verandah.

Light. Those who have blinds on their houses should remove them; in fact, completely clear glass would be beneficial. There is no burn in the sun's rays now, and the direct sunlight assists much in the production of flowers. The roof of my glass house has been about one-third clear glass and the remainder nearly so all the summer. I expected some burning, but to my surprise one leaf only on a *Cattleya* was affected, and that was within two inches of the glass. I also suspect it got dry whilst I was away on holidays. The tea-tree on the bush house was almost negligible and no burning occurred.

Cattleyas. All moss should be removed from the tops of pots and baskets and, in the case of baskets, from the sides also. It is necessary to water these plants during the winter just sufficiently to prevent bulbs from shrivelling. The presence of moss retards drying. I top-dressed manv of my *Cattleyas* with peat moss which, I believe, was a factor in producing the excellent growth last season. This peat moss I have washed out with strong hose pressure, because, when it becomes quite dry it cakes and water will not penetrate, so any water applied would merely run off without wetting the compost.

I have one difficulty only with *Cattleyas.* A few flower in June or July; the flowers open, but, on account of the low temperature, they will not develop to their full size. I have to transfer these plants to the heated house of a friend until the flowers are fully expanded, when I bring them back to my own house. These plants do not make their new growths until midsummer, hence the late flower development. I feel that if I could induce those plants to shoot early in spring they would flower before winter. The best plan, of course, is to confine *Cattleyas* to those that flower in spring or summer.

There are some types which produce sheaths in late autumn but do not flower until Spring. Keep water from those sheaths, as they are apt to become dry and porous; water seeps through and rots the dormant flower buds.

Dendrobiums. The treatment outlined for *Cattleyas* will also apply to *Dendrobiums*, but they will require a little more water. The flower buds will begin to show in late May or June, and some watering is necessary to keep them moving. Excessive watering at this stage might produce aerial growths. The bulbs of pendulous types, i.e., those that form thick pseudo-bulbs with slender weak bases such as *Wardianum, Pierardii* and some types of *nobile,* should be allowed to hang down. Mr. Cooper, of Sanders, when here advised me that such types produced more flowers when allowed to assume their natural position. Some species like *Wardianum* will have started into new growth before the flowers open. Do not be misled into increased watering, as root action will not commence until after the flowering has finished.

Some text books I have read advocate the withholding of water from *nobile, Wardianum, infundibulum, densiflorum* and others during practically the whole winter. That may be correct in a heated glass house, where a high atmospheric moisture can be maintained, but in a bush house during dry periods or in my airy unheated glass house, that treatment would be disastrous, the bulbs would shrivel excessively and the flowers be few and small. I have tried that treatment and know the ill effects. In dry sunny weather I find it necessary to water my *Dendrobiums* once a week, but growers should use their own judgment. Keep the bulbs plump.

Some years ago I received six hybrid *Dendrobiums* from Java, with *Phalaenopsis* somewhere in their lineage. They gradually went down hill until finally I gave away all but one. This I placed in a frame, close to the glass roof, and removed all paint. Each night during spring and summer that plant was liberally watered. It has just completed a sturdy growth about 18 inches long and is showing a flower spike.

Cymbidiums. August will see the peak of the flowering season, and from what I have learned from many growers, flowers should be very plentiful. There is little to be done generally except to watch plants for those insects that have a weakness for blossoms. As soon as flowering will permit, place the plants in a warm situation, if possible, to induce early growth. New growth, however, can, I believe, be too early. I have several plants which grow very well and make large bulbs but which refuse to flower. Each year they start their new bulbs in April or May and mature them months ahead of the time flower spikes begin to appear. I am wondering whether this very early shooting is interfering with flowering. Flower spikes are usually developed on the half matured bulbs, and these bulbs reach that stage about Christmas, far too early for flower spikes, consequently they have several months rest and then just start to grow again. I must find some means of retarding the new growth and so possibly bring about a flowering condition.

At recent meetings of the Orchid Society of N.S.W., a disease which is seriously affecting *Cymbidiums* was discussed. The nature of the disease is not definitely known, but personally I suspect fungus, although experts could find no trace of that agent. For those who have not experienced this disease or may have it unknowingly, I will describe its action. It attacks the roots at the base of the bulb and gradually works down to their tips. The loss of roots holds up the development of the bulb. New growths appear which grow new roots, and these in turn are affected. The growths get smaller and smaller and in many cases the plant ultimately dies. Pale green and yellow spots or stripes appear in the foliage, and these later turn black. The disease is not incurable, but if neglected will wreck the plants even if it does not kill them. Various causes have been suggested, such as over-potting, over-watering, too heavy a compost. If fungus, the implication is too acid a condition, as fungus cannot exist in a pH of .6 or over.

If your *Cymbidiums* are not flourishing there is a reason and, failing any obvious cause, the trouble must be with the root system. In such cases I would suggest taking the plant from the pot and thoroughly hosing away all soil. Do not be misled by apparently healthy roots. I have seen a pot nearly full of succulent roots with fresh green tips, but from the bulbs for varying distances those roots were quite black under the skin and, consequently, dead, the distance gradually extending until the whole root is dead. Examine each root carefully at its base and cut away all those affected, treat with permanganate of potash or colloidol sulphur, and re-pot in fresh compost in a clean pot.

It might also be advisable to check the pH of the compost being used, as it might be excessively acid. From what I have seen I believe plants growing well do not develop the disease, neither on their own account nor from nearby affected plants. Moreover, affected plants, if given suitable conditions, will quickly grow out of the trouble.

This brings us back to the same old question: "What are suitable conditions?" In this connection I quote extracts from an article by Mr. Alexander, an English Orchid trader, which appeared some time ago in an English journal:

> "*Cymbidiums* revel in sun-heat by day, so long as the house is well ventilated and there is moisture in the air, with a cool atmosphere at night so that they may recuperate after the day's heat. Sunlight is, indeed, essential to promote strong healthy growth and to ensure satisfactory flowering, and only a thin shading need be employed on bright hot days to prevent scorching of the foliage.
>
> "The principal causes of failure with these Orchids are:
>
> (1) Over-watering the roots.
> (2) Too much shade.
> (3) A stuffy atmosphere.
>
> "*Cymbidiums* are for the most part strong and fleshy in the roots, which therefore need a moist compost about them, but, as with all ordinary greenhouse plants, the safe principle of allowing the compost to become moderately dry before giving a further soaking of water, is an essential factor in their proper cultivation. In summer the foliage should be freely sprayed with a syringe, once or twice during the **early** parts of the day.
>
> "Refrain from over-potting, or from disturbing the plants so long as the soil is not sour, and the pots afford room for the plants' development. Plants in a root-bound state will always more readily produce flower-spikes."

I certainly believe that over-watering is harmful, but if the compost be made sufficiently light and open, either by the use of charcoal or broken pottery, that danger would be minimised.

Personally I am opposed to confining *Cymbidiums* in small vessels except as a means of inducing early flowering for some particular purpose. I have, however, often seen very small plants and even freshly imported plants with practically no live roots, placed in 10 or 12 inch vessels. That, I think, is plainly asking for trouble. Plants so treated would probably develop a condition inducing the disease under discussion. Another factor which might weaken a plant's resistance is intense dryness at the roots on a very hot day. The soft fleshy roots in contact with the hot pot might possibly be seriously injured.

From August onwards re-potting should receive attention, but do not re-pot unless absolutely necessary, as breaking up clumps generally interferes with flowering. The removal of some of the old bulbs will allow more room for new bulbs to expand and so postpone the need for re-potting.

Cypripediums. These are now at their peak of flowering, and whilst watering will not need to be so frequent, they should not be allowed to get dry, particularly if in tan bark. Tan bark is so open that if left unwatered for a few days it may, in warm weather, dry right through. I was curious recently to examine the roots of a recently acquired plant and turned it out of the pot. Although watered lightly every other day it was damp on the surface only, the remainder being quite dry. When watering, therefore, be sure that plenty is given.

More than one collection I have seen recently was badly affected by thrips. *Cypripediums* seem to suffer more than other Orchids when attacked by this insect. It seems to attack the heart of the plant, which is long in recovering. The brown patches are very obvious and the plants should receive several sprayings at intervals of a few days or the foliage dipped and then allowed to drain. Judging by the flowers brought to the Society's monthly meetings, increasing numbers of the modern types are being grown, many of which are particularly beautiful.

Oncidiums. I have a very fine spray of *Oncidium varicosum Rogersii* out just now with over 60 blooms. This genus has two distinct types, one with many flowered sprays with small individual flowers, and the other with larger flowers but a few on the spray. Of the former, *Oncidium varicosum Rogersii* is perhaps the most attractive. Its flowers are larger than a two-shilling piece and mainly vivid yellow in colour. It is easy to grow in a bush house or unheated glass house. It will grow either in a pot of pure fibre, on a block of hard fibre, or on a tree fern butt. I would urge readers to endeavour to acquire this species; it is well worth while. The second type mentioned will grow without heat but is more difficult to handle.

Vandas. With the exception of *Vanda teres* this genus is not happy with me, and I will have to try many ways before my experiences will be of use to growers. *Vanda teres* still continues to flourish on the piece of tree fern stem.

Thunias. At the end of August or early September these will begin to shoot, but September will be time enough to re-pot.

Coelogyne cristata. The flower spikes will now be well developed and will open late August or September. They would be improved by now bringing them into the glass house, and placing them some distance from glass with a view to increasing the length of the flower spikes, which, if the plant is left in the open, are apt to be rather short.

War conditions have reduced the demand for cut flowers and this, I hear, has induced many growers to cultivate a greater variety of Orchids. This is all to the good and should make their collections more interesting. There is nothing very attractive in a house full of *Cattleyas* or, for that matter, most other Orchids, when not in flower, and the acquisition of other species will provide flowers over longer periods. In my small collection I am never without blooms, largely on account of the variety of types and species.

● ***Cymbidium suave—A "Discovery."*** On holidays in November, 1939 (at that time Orchid growing was something new to me), I was thrilled to find in a tree stump, on the golf course of one of our most popular resorts, a very pretty little plant with a number of sprays of flowers out, which I knew were Orchids. I took careful note of the spot and at the end of my holiday came back very early one morning with a knife "borrowed" from the dining table and a flower pot "borrowed" from the gardener's shed, and carefully dug out a portion of the plant, scraped away some of the wood of the tree stump, gathered up some sandy soil and brought it home—very pleased. The plant did very well for a time and produced something which I thought would be a flower spike but it has just remained the same way for over a year. I described my find to a well-known Orchid dealer in Sydney who casually remarked, "Oh, yes, that's *suave;* will only last about two years; not much of a flower." My plant has made three new shoots this year and I think it will last much longer than two years. I feel quite confident it will produce a flower spray next season. —Miss A. HARRIS, Rose Bay, 31/1/1941.

Stanhopea Tigrina (Bateman)

J. MURRAY COX, *Brisbane, Q.*

● This Orchid, a photograph of which appeared in the Australian Orchid Review for December, 1940 (Vol. 5, No. 4), belongs to a genus of Orchids of the *Vanda* tribe, all the species of which are natives of Central and South America or the islands in the Caribbean Sea. There are about thirty known species, and of these the finest, both from the points of view of size and of colouring, is *S. tigrina.* The plants are handsome with their broad, ovate, somewhat glossy, dark green, membraneous, plicate leaves, which grow on longish stems from the rotund pseudo-bulbs, which are smooth at maturity, but become ribbed in their old age. These pseudo-bulbs are about 1½ inches high and are about the same in thickness. They are swathed in fibrous sheaths.

The plants of the genus have a peculiarity in common with those of the allied species *Coryanthes* and *Houlletias,* in that the racemes grow from the bottom of the pseudo-bulbs, and are pendulous. My plants have never carried more than two flowers to a raceme, but in their natural state up to five or even seven have been recorded. Normally, the blooms are about 5 to 6 inches across, but the flowers shown in the frontispiece to the December, 1940, issue were about 10½ inches from tip to tip. They are peculiarly formed, and the labellum and column combine to form a complex structure something like a cage. The sepals and petals have a tawny yellow background, the former being attractively barred and blotched with dark purple, while the petals, which are very broad and shapely, have great masses of reddish purple dotted with lines of a darker purple. The lip is a beautiful glossy ivory cream dotted thickly with lilac and purple spots. The flower has a very strong odour resembling a mixture of woodbine and vanilla. On a still warm night this scent was strongly noticeable at a distance of 200 yards from the house in which it was growing. The flowers live for only 4 to 5 days, and by the end of that period you are glad to see the last of them on account of the aforesaid scent, which is all-pervading.

S. tigrina is an inhabitant of Panama and other Central American States. It grows on the trunks of trees in the forests at a fairly low altitude. It grows quite vigorously in Brisbane in an open bush house all the year round, but would need glasshouse treatment in Sydney. It likes ample light, but not direct sun rays in the middle of the day.

For compost I have found that a mixture of osmunda and polypodium gives good results, while regular applications of liquid manure once a week during the summer, and while the flower raceme is developing, have a beneficial effect. I use alternate applications of Floraphos and a solution of cow-dung—about 2 lbs. of dung to 4 gallons of water, with about 4 ozs. fowl droppings added—the mixture standing undisturbed for 3-4 weeks before using.

All the *Stanhopeas* should be grown in open bottomed baskets so that the flower spike can find an exit. Flowering period is from late summer to autumn.

During the summer period the compost must be kept damp. In the winter a spraying once or twice a week is all that is necessary.

Considering the short period for which the flowers last, the development of the flower raceme is very slow, but it is most fascinating to watch. The embryo flowers are about the size of a dried pea at the beginning, and they gradually grow until they have the dimension of a tennis ball. Once they commence to burst, however, they open rapidly.

● At the February monthly meeting of the O.S. of N.S.W., a presentation from members was made to the Honorary Secretary, Mr. T. H. James, in recognition of his services to the Society. Mr. James has been Hon. Secretary since the inception of the Society, and its success is largely due to his unremitting efforts.

● We learn from a reliable source that the Orchid Nurseries in England have announced that all exportations of Orchids to Australia must be at the importer's risk. Insurance can be arranged in England by paying the necessary premium to cover war risks—which, we may add, is rather high at present.

● There are still a number of outstanding membership subscriptions to the Orchid Society of New South Wales. The Honorary Treasurer, Mr. G. J. C. Tosi, 39 Martin Place, Sydney, is anxious to have these squared up before the end of the financial year in June. Please help him by posting a remittance in the next mail.

Concerning Ants

Dr. C. JAEDE, *Mascot, N.S.W.*

● In these days of extreme anxiety I find it more or less impossible to sit down and write a serious article on a subject interesting to an Orchid grower. Of course, it is fully appreciated by me that the subject dearest and nearest to the cultivator is the magnificent manner in which his own plants have responded to his own expert care. Like the members of a well-known profession, he . . . ?

Some time ago I noted in this Review, the occurrence amongst some of my plants, of a particularly disfiguring and toxic fungoid disease appearing mostly on *Aerides, Vandas, Coelogynes* and *Dendrobiums*. Not only does it spot the leaves and poison the plants, but, as Judge Markell has pointed out, it brings about a strangling of the stem of the Orchid where the infected leaf joins on to it. I could describe this process in my own type of technical language; but if I were asked to do it in popular language, I should say that the base of the leaf becomes woody around the stem in consequence of which the latter cannot swell.

In my previous article I expressed the opinion that it might have its origin from either tanbark below the benches, or sour and sodden moss on the benches; now, however, whatever the original source of the fungus, I am quite sure that the real "nigger in the wood-pile" is our old and esteemed friend the black ant; and although it visits all the plants in the house at one time or another, it is only the leaves of those plants which it bites that become infected. Watch this "cute little gentleman" on the young leaves of *Dendrobium Phalaenopsis* or *D. nobile*! "He" scampers up the stem to the leaf and there "he" evidently finds something pleasing to his palate. Apparently "he" acts in the same way as the flea does to its human host and to a certain extent with the same effect. For some days or weeks afterwards a spot appears, at first brown in colour, later darkening to almost black. I feel quite sure that what has occurred, is, that the ant, in biting the leaf, has infected it with the fungus, but I am at a loss to know where the ant originally obtained the fungus; it is, of course, likely that in scampering over the leaves which have been previously infected that it gathers over itself spores of the fungus. For, as I previously noted, a centre appears in the brown spot through which the spores are extruded.

The obvious treatment for this disease, and incidentally many others, is to eradicate the ant. How easy! I have tried every alleged exterminator on the market. I am quite sure that these poisons kill all the ants that take it into their heads to eat the bait. Unfortunately my experience is that once the experience of the ants is unlucky, no more will these insects partake of any tempting bait for several months. I have found that a mixture of honey and borax acts as deadly as any poison.

The ants, as I have just stated, will at certain periods eat this mixture voraciously, and the resultant slaughter will be enormous. Then for weeks and weeks they will pass it by, taking absolutely no notice of it; then one day once again they are "on the bite." I wonder if this has anything to do with the feeding of their larvae? However, this is one of my random notes, and I think it would be interesting to hear of the experiences of others.

LYCASTE CRUENTA

Growing outdoors at Manly, N.S.W. Photo natural size.

Photo by H. J. R. Overall, Manly, N.S.W.

Symbiotic and Non-Symbiotic Propagation of Orchids from Seed

S. M. HOSKING, A.M.T.C., A.A.C.I., *Melbourne, Vic.*

● Orchid seeds differ from the seeds of most other plants in that they are not endowed by Nature with sufficient food reserve to see them through their germinating period, and unless from artificial or natural resources a further supply of food or stimulant is forthcoming, the tiny seed is unable to carry on, and dies of starvation. In nature, this extra food supply is supplemented by the aid of a fungus which helps in the germination of the Orchid seed. When two such organisms of different affinities live constantly in close association, the term applied is "symbiosis." The historic case of symbiosis is that of the lichens, which really consists of two plants, a fungus and an alga, associated for the benefit of both. Amongst plants one of the most interesting cases is that of the bacteria, which form nodules on the roots of leguminous plants, enabling these to utilize the free nitrogen of the soil.

Under ordinary circumstances the roots of Orchids become infected with a fungus which is beneficial to the plant. If this fungus is present with the seed, under conditions favourable for germination, the hyphae, or multi-cellular filaments of which the fungus is composed, penetrate the seed, and stimulate its growth. The first scientific methods of Orchid propagation were along these lines. The fungus was isolated from the Orchid roots, and grown on suitable media. A copious supply of this fungus was planted, together with Orchid seeds, under ideal conditions. Considerable success was obtained, and this method of symbiotic propagation is still widely used.

Further research was carried out by Dr. Knudson on this appropriate Orchid fungus, and he showed that its true function was to furnish a source of carbohydrate (sugar) to the Orchid embryo, and also to maintain a favourable degree of acidity in the medium on which the plant was growing. By using suitable media which contained sugar and inorganic nutrients, together with a definite acid content, he was able to prove that Orchid seeds could be germinated, and healthy seedlings raised, without the aid of the appropriate fungus. This method of propagation is known as the non-symbiotic method.

Before dealing more fully with these two methods of propagation, there are a few points on collecting seed which are worth mentioning.

It is essential that the pod be allowed to ripen on the plant in order to get maximum fertility from the seed. In some instances 12 months or even more may be necessary for the complete ripening of the capsule. When approaching maturity a capsule should receive daily attention, and at the first signs of rupture or cracking, be detached from the plant and lightly wrapped in clean tissue paper. Under no circumstances should it be stored at this stage in a closed vessel or tin, for the reason that moisture evaporating from the capsule may induce mould spores thereon to germinate.

If the seed cannot be sown immediately, it may (after a few days) be shaken out and stored in a clean tube lightly plugged with cotton wool. Best results are obtained when the seed is sown as early as possible after gathering.

Probably 50 per cent. of the seed pods to which we have had access turned out to be sterile, for while the flasks have remained pure for many months, no sign of germination has appeared with a number of them; while where a pod is fertile equal germination takes place in every flask, and in other cases the whole of the flasks of a cross have been failures.

Symbiotic Method

A. Isolation of Fungus.—Probably the most difficult operation in the propagation of Orchids from seeds by symbiosis is the isolation and purification of the root fungus or Mycorhiza. The term "mycorhiza" is applied to the structures formed by the association between the mycelium or compact tufts or masses of interlacing hyphae of a fungus, and the roots of one of the higher plants. In the case of Orchids, the mycorhiza is endotropic, that is, the fungus occurs within and between the cells of the host, and has little connection with a mycelium in the soil.

The fungus apparently enters from the soil, and lives to some extent as a parasite in the outer layers of the roots. In deeper lying and presumably better nourished cells, its progress is retarded. Tangled tufts of hyphae are formed in this region; they are digested by the host, and leave dead residues of rounded form. The fungus does not form spores within the host, and fails to establish itself permanently as a parasite. So that, when isolating this fungus, only the young roots are taken, where the fungus is present in its most active state.

The roots are cleansed of any adhering dirt, lightly scrubbed, using a soft brush and a good frothing soap, then well rinsed in water. As the outsides of the roots are certain to contain foreign fungus or mould, the root is sterilized for a few minutes in a very dilute mercuric chloride solution, and rinsed in sterile water. The outer skin is removed by means of a scalpel and forceps, thin sections are cut from the root with a sterile razor blade, starting from the tip and working back, and two or three of these sections are placed in each tube of sterile culture, the tubes plugged with cotton wool, and placed in an incubator.

Several formulae have been suggested for the media to isolate this fungus. Some of them are purely synthetic, while others contain malt and salep, which is the name given to the watery extract of Orchid tubers. With either medium, quite a number of tubes have to be inoculated with root sections in order to obtain any growth of this mycorhiza. It is almost certain that foreign fungi of the more common varieties will be grown as well, and it is necessary to transfer a portion of the right fungus on to new sterile cultures in order to obtain it in a pure state. Even when obtained pure, it has to be transferred to a new medium every three or four months in order to keep it alive and in a healthy condition.

B. Planting of Seed.—The medium on which the Orchid seeds and fungus are grown is usually a natural sterile substratum. For this purpose, finely chopped polypodium, osmunda or peat have been used successfully. The material is boiled in water, then washed and transferred to Erlenmeyer flasks until a layer about 1 inch deep is obtained when pressed down firmly. The fibre is then saturated with a nutrient solution which usually contains potash, phosphate, iron and magnesium. Carbohydrates (sugars, starches, etc.) are not added, as the fibre contains these in a bound organic form, which the fungus transforms into a state easily assimilated by the seedlings. The flasks are closed with cotton wool stoppers, and sterilized in an autoclave in order to destroy mould spores and bacteria. An autoclave is a strong metal container in which water under pressure is boiled so that the steam surrounding the flasks is somewhat above the ordinary boiling point of water. The flasks should remain in the autoclave for 30 minutes at a pressure of 15 pounds. The sterile seeds are then introduced, together with some of the fungus, and the stoppers replaced.

An agar jell containing chopped up fibre and inorganic salts can also be used as a medium. Coir fibre is particularly recommended in this procedure. Instead of inoculating the compost with the fungus at the time of seed planting, some people prefer to inoculate first, and incubate for a week or so in order to get a good penetration of the fungus through the fibre before planting the seed.

Non-Symbiotic Method

Preparation of Culture.—The first step in the preparation of a culture for growing Orchids non-symbiotically is to decide the ingredients to be used. In reviewing the published literature on this subject, it will be found that a considerable number of workers have used different formulae for the media, usually claiming certain advantages with different ingredients. When it is considered that the time from the planting of Orchid seeds until blooms are obtained, may occupy from 4 to 8 years, it can be well understood that any research work on different cultures must necessarily be very slow.

In conducting work on this subject, a fair indication of the different media can be obtained by measuring both the development of the plant and the roots. Some media give rise to rapid root formation, while with others the leaves appear to grow more profusely with poor root development. We have also to take into consideration the robustness of the seedlings. It may be found that with a certain medium the plants will progress quite well for a short time, and then gradually lose colour and become very stunted.

Fundamentally, most of the formulae for cultures put forward are almost identical, and consist of inorganic salts, carbohydrates (starches, sugar, etc.) and an organic gelling agent, agar.

Inorganic Salts.—The inorganic salts are used to give a ready supply of nitrogen, phosphate and potash. Nitrogen is usually introduced as either ammonium sulphate or as the nitrate salt. Burgeff, who has done a considerable amount of research on these cultures, pointed out that Orchid seeds germinate more favourably when the nitrogen was available as ammonium sulphate, and this seems to be fairly well substantiated by later workers. Potash and phosphate are made available by using potassium phosphate; calcium and magnesium are usually introduced in the form of magnesium sulphate, and calcium nitrate. Chlorides are sometimes used either as sodium chloride (salt) or potassium chloride.

Carbohydrates.—An interesting article on different sugars used in cultures for the non-symbiotic germination of Orchid seed appeared in the Annals of the Missouri Botanical Garden, November, 1933, and was written by Mr. F. Lyle Wynd. He examined the growth of Orchid seedlings over a period of eight months, using a series of sugars, each of which was added to three different inorganic media in amounts to give seven grams of carbon per litre. The order of excellence of growth in the different sugars was: d-mannose, d-glucose, maltose, d-fructose, sucrose, raffinose. No growth was obtained on five other types of sugars.

There is an interesting point with reference to d-mannose, which was found to give the best results. Several workers have observed that Orchid seedlings grown on a cocoanut fibre compost which had been inoculated with the appropriate fungus had given excellent results. Cocoanut fibre contains a substance called *mannans*, and by chemical means it is possible to convert this *mannans* into the sugar *d-mannose*. It has been proved that Orchid fungi can effectively convert starch into available sugar. Therefore, it is probable that when Orchids are grown on cocoanut fibre symbiotically, a certain amount of mannose is made available to the plant. As other fibres and mossy substances only contain small amounts of *mannans*, this may account for the slow growth of seedlings on these. So far we have not been able to obtain sufficient quantities of d-mannose to try out this sugar for ourselves, and have been using d-glucose.

I would just like to point out here that there are really three different types of glucose available. The commercial glucose, which is a very thick water-white liquid, and is not suitable; glucose D, a white powder used for medicinal purposes; and d-glucose (Dextrose), also a white powder, which is the one we have been using.

With reference to the agar, which is of seaweed origin, we have found the powdered variety to be more suitable, as it is dissolved more easily. It is used in the culture both for its nutritious value and its jelling properties.

The formula we have been using with most success to date is really a slight modification of Dr. Knudson's Solution B. For the preparation of one litre of solution, the following ingredients are used:

Solution A.	Calcium Nitrate 1.0 gm. Ammonium Sulphate 0.25 gm. Magnesium Sulphate 0.25 gm. Ferric Phosphate 0.001 gm. 300 ml. Distilled H_2O.
Solution B.	Di Potassium Hydrogen Phosphate .25 gm. Di Hydrogen Potassium Phosphate .25 gm. 300 ml. Distilled H_2O.
Solution C.	d-Glucose 20 gm. Agar 17.5 gm. 400 ml. distilled H_2O.

The three solutions are made up separately, mixed together, and the mixture boiled for a few minutes until clear.

pH Value Determination and Control

The two potassium phosphates used in this culture constitute what is called a buffer. This means that the solution or nutrient has a definite acidity, and the two phosphates help to keep this acidity constant. We mentioned earlier when on the subject of symbiosis that one of the functions of the Orchid fungus was helping to maintain a favourable degree of acidity for the plant. As there are no fungi used with this method of propagation, the acidity has to be controlled by chemical means, i.e., by the *buffering* action of the two potassium phosphates.

Acidity plays an important part in all culture work and has to be very accurately estimated. This is usually done by measuring what is known as the pH value of the media. Very briefly, pH value refers to the acidity or alkalinity of a substance. Taking pure water as the standard of neutrality with a pH of 7, then if the solution or medium has a value higher than pH7 it is alkaline, if lower it is acid. With Orchid culture, the pH value before planting the seed should be 4.8 to 5.2. The easiest method of determining pH value is by the means of indicators which are dyes that change colour at certain values. Methyl red will be found to be quite satisfactory, changing in colour from orange to pink at about pH 5.0.

Influence of Sterilization on pH Value.—It is often found that a culture made up to a definite pH value may alter considerably after sterilization. This may be due to partial decomposition of one or more of the ingredients or to chemical action between them. Depending on the composition of the nutrients we may get either a drop in pH value (i.e., the nutrient becomes more acid) or a rise (i.e., the nutrient becomes less acid). The usual procedure is to test a portion of the nutrient for pH value before and after sterilization. If the test after sterilization varies from the required pH, then either dilute acid or alkali has to be added to the bulk nutrient and another test carried out.

Influence of pH on Seedlings and Agar Jell.—The pH value also influences, to a certain extent, the consistency of the agar jell. It is desirable to have this jell as soft as possible without losing its jelling properties, and reverting to a semi-liquid. If too hard and stiff, the delicate Orchid roots find it hard to penetrate, and absorb the nutrient; if too soft, the mass, after a little handling, turns almost to a liquid. At pH 4.8 and 5.2, and between 1.5 and 1.75 per cent. agar a suitable jelly is usually obtained. Often the jelling properties of the agar vary, and it is always advisable to test any particular sample before making up a bulk quantity of nutrient. Orchid seed will germinate on media outside the 4.8 to 5.2 pH range, but the seedlings do not grow well. If the medium is almost neutral, i.e., pH 7, the seedlings do not develop a healthy green, but more of a yellow-green colour. Even green seedlings grown on a medium of the correct pH, soon lose their green colour if transferred to a neutral medium.

As we mentioned earlier, the medium used for non-symbiotic germination of Orchid seed, and the temperature at which this medium is maintained, is ideal for the growth of the most common types of mould and bacteria which are always floating about in the air. These grow on the medium much more quickly than Orchid seed, and will smother the seed or seedlings in a few days. When it is considered that Orchid cultures have to remain sterile for almost a year in a hot house, where the atmosphere is absolutely laden with mould spores and bacteria, it can be seen that every precaution has to be taken in the planting of the seed and in storing the flasks during this period.

An article appeared in the Annals of the Missouri Botanical Garden a few years ago written by Mr. F. Lyle Wynd in which he draws attention to this difficulty, and sets out a routine in order to overcome it. We have tried this out and find it very effective. He states:—

> "It is extraordinarily difficult to maintain sterile cultures in warm moist atmospheres over long periods of time, and after many preliminary failures the following plan was adopted. The solutions were added to the culture flasks through a funnel, care being taken not to moisten the necks of the flasks. The flasks were then closed with cotton plugs. A duplicate set of cotton stoppers was carefully and tightly rolled, sterilized in empty flasks in the autoclave, and then immediately transferred to the dry-air oven until thoroughly dry. The seeds were shaken vigorously for thirty minutes in a small vial of calcium hypochlorite prepared as recommended by Wilson ('15)." (This solution is prepared by mixing 10 gms. of calcium hypochlorite (bleaching powder), with 140 c.c. of distilled water. This is vigorously shaken up for a few minutes and then filtered. The clear filtrate is used for sterilizing the seed.) "This vial was then clamped in a floating position so that contaminating substances might not fall in from the air. A culture flask and an empty flask containing the specially prepared cotton plugs were held in a horizontal position in the left hand. The temporary cotton plug was withdrawn from the culture flask and dropped. A platinum loop inoculating needle, held in the right hand was quickly flamed and a loopful of seeds transferred directly from the hypochlorite solution to the drop of moisture that always exudes from the solidified agar. The neck of the flask was then flamed and the especially prepared stopper quickly drawn from the blank flask and inserted in the culture flask. This procedure is advisable, as it involves a minimum of exposure of the cotton plug that is finally used in the culture flask, and insures its perfect dryness.

"The drop of moisture containing the seeds on the edge of the agar was then distributed around the entire margin by rotating the flask carefully. This even distribution of seeds was maintained by placing the flask in a rack so constructed that the agar surface was perfectly level, thus preventing the liquid drop from draining to one side and carrying the seeds with it. After a convenient number of flasks had been inoculated, the necks of the flasks were again flamed and the cotton plug well charred on the surface. The plugs and the outer surface of the necks were then moistened with a saturated $HgCl_2$ solution. Heavy waxed paper was then dipped in the $HgCl_2$ solution, tightly wrapped around the stoppers and the upper part of the flask, and held firmly in position by rubber bands. The writer has found that unless these precautions are taken, fungi will frequently grow along the surface of the flask and penetrate the stopper, contamination usually not appearing until three or four months after inoculation. Bernard, certainly a well-trained and experienced mycologist, has commented on the extraordinary difficulty of maintaining Orchid culture sterile in the moist warm atmosphere desirable for germination. By taking the above precautions, the writer has maintained sterile cultures as long as three years in moisture-saturated atmosphere at 25-35°C."

As some workers consider that an adequate air exchange is necessary for the growing seedlings, we have always used small beakers, rinsed out with mercuric chloride solution, to cover the cotton wool plugs in place of the waxed paper recommended above.

We have always adopted the extra precaution when actually planting the seed to work in a sterile cabinet. This is a wooden box about 2 feet long by 18 inches deep by 18 inches high. front there are two holes about 6 inches in diameter through which the flasks and instruments can be handled. In order to sterilize the air inside the cabinet, it is sprayed out with a 1 per cent. solution of mercuric chloride, and after a minute or so the bottom of the cabinet is wiped out with a piece of cotton wool. The mercuric chloride spray brings all the mould spores to the bottom of the cabinet, but may not kill them, so it is necessary to wipe them out with the cotton wool. The cabinet may then be regarded as sterile, and will remain so for approximately half to one hour under ordinary conditions of planting.

With reference to sterilization of the culture flasks by autoclaving: If an autoclave is not available, an alternative method is to place the flasks on a rack above water boiling inside a vessel such as a large saucepan provided with a loose-fitting lid. The water is kept boiling for about half an hour, so that the flasks are surrounded by steam. They should then be removed and allowed to cool. This operation should be repeated on three successive days. The flasks are then ready to be transferred to the hot house, or, preferably, to an incubator with thermostatic control and high humidity.

Cultivation of the Seedlings

For the first month the seedlings are covered with brown paper to ensure complete germination.

An interesting experiment was carried out by J. C. Ratsek at the Cornell University of N.Y. to determine if long periods of daylight hastened the growth of Orchid seedlings. Tubes of *Cattleya* seedlings were used that had been germinated according to the method of Knudson:

> "The tubes were kept in a case at the University greenhouses, and shaded with cheesecloth when necessary. A relatively constant temperature was maintained by proper aeration, and heating units connected to a thermostat. The temperature averaged 85 degrees F. during the day and 72 degrees at night during September and October, and 78 and 68 degrees respectively throughout the winter.
>
> "The normal daylength was supplemented by a 40-watt Mazda lamp suspended 30 inches above the tubes. The light was kept burning in the evening to bring the total hours of daylight to the requirements of the experiment. The normal daylength for the controls varied from 16 hours and 20 minutes in August, to 11 hours in December. The experiment was begun August 5, 1930, and continued for approximately four months. At the end of that time 100 seedlings were taken at random from each tube and weighed."

The results of this experiment showed that long-day treatment increased the fresh weight of Orchid seedlings. This was greatest during the winter months. With the long day exposure there was a marked increase in the length of the seedlings, the roots of which were long and thin compared with the short and tuber-like roots of the seedlings which were subjected to short day exposure.

Some six weeks in the hot house is sufficient to allow the naked eye to observe signs of germination. The first signs of germination comprise the swelling of the seed to transparent globular form. These minute transparent globes slowly grow, and as they grow they change colour from a transparent white, firstly to a yellowish-green and ultimately to a deep green. Some three or four months after planting, small leaves can be observed starting to grow from the apex of each globe, and a month or so later minute roots can be seen pushing their way into the agar.

After several months in the flasks, in the case of *Cymbidium*, the leaves of the baby plants are perhaps ½ inch long and the root from ⅛ inch to ¼ inch long. At this stage they are ready for transplanting. The transplanting of the seedlings is a most tedious job, and in many cases it is practically impossible to handle them singly, for, particularly with *Cymbidium* seedlings, the seeds adhere together when planted, and grow into large colonies of plants attached to each other, rather than singly. Where this had happened, we lifted the colonies out and placed them into a mixture of fibre and moss in the base of jam jars, using the lids of the jars to harden the plants slowly. This method would have been a great success had the jam jars been provided with a little drainage. However, it was a reasonable success, and a large number of plants have been saved.

After a couple of months in the jam jars, those that were large enough to handle were transplanted into 1½ inch pots, some into pure fibre, some into a mixture of fibre and moss, and some into pure moss. From our observations those planted into the mixture of fibre and moss have done best. After transplanting, the plants appear to remain dormant for a period of 3 to 4 months, and then they suddenly start to move. The probable reason for this dormancy is the lack of the provision of a proper incubator house where a very high temperature and humidity can be maintained. Unfortunately, our seedlings have, by the lack of equipment, been subject at all times to the conditions operating in a standard Orchid house.

Combination of Symbiotic and Non-Symbiotic Methods

It has been noted by several observers that when transplanting non-symbiotic seedlings from the culture to ordinary fibrous compost, there was a slight check in their growth. It was with a view to overcoming this lapse that experiments were carried out by Mr. E. Clements. He conceived the idea of transferring asymbiotic seedlings while quite small to flasks containing a prepared compost which had previously been inoculated with the appropriate fungus, thus combining the non-symbiotic and symbiotic methods. He found the young seedlings made better progress by this method, retained all their green colour, and their root formation was sturdier. After 4-5 months from the time of transference they were then removed to the ordinary compost in pots, and from this point almost no check was experienced. It appears, therefore, that this endotropic mycorhiza or root fungus is helpful, although not indispensable, in Orchid seedling raising.

Orchids have been raised from seeds to flowering plants asymbiotically, remaining in sterile cultures the whole time. The root system was very extensive, and when examined under the microscope no trace of the appropriate fungus was found. These plants were then transferred to osmunda fibre, and some time later the roots were again examined. The fungus was then present.

Should the amateur, without a knowledge of chemistry and proper equipment, desire to produce Orchids from seed, he would be well advised to follow the old-fashioned method of planting the seed round the parent plants and be satisfied with a relatively small germination, but should anyone be willing to spend the money to approach the problem properly, there is little doubt that large numbers of seedlings could be rapidly produced, should the proper equipment be provided. This in particular would include an incubator for flasks, and a specially built hot house for seedlings.

These experiments were carried out in collaboration with Mr. Bruce Hogg and Mr. Basil Hodgins, to whom I am indebted for supplies and advice.

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● *Vanda Batemani* (more correctly *Vandopsis lissochiloides* Pfitz) is a sturdy subject requiring glasshouse treatment about Sydney. Several local growers have the species. This subject was in flower at Mr. N. MacDonald's Orchidery, Summer Hill, on February 22, 1941. The flowers mature in rotation on a long stalk, six flowers being mature at the same time; those in front are bursting or in bud, those behind are fading or withering. The spike lasts about three months. The following are the particulars of flowers examined: Colour of the sepals and petals, canary yellow, with dark reddish-brown spots and markings; the outside of the sepals and petals is Orchid purple. The flowers are two and a half inches (6½ cm.) across; the distal end of the labellum is magenta, the proximal end shading into canary yellow. Sepals 35 mm. x 17 mm., petals 30 mm. x 15 mm. Flowering season, January to March (Sydney). Sir Harry Moxham, of Rose Bay, also flowers the species.

Memories of an Orchid Lover

Rev. H. M. R. RUPP, *Northbridge, N.S.W.*

● I fell in love with Orchids at a very tender age. Some of my friends may be sceptical, seeing in me few signs of the decrepitude of age; but two of my clearest recollections of small-boyhood are (1) a thrilling serial in the "Boys' Own Paper" about Orchid-hunting in Borneo, and (2) the capture of the Kelly Gang! At that time I lived in the village of Koroit, in the Western District of Victoria, where my father was Vicar. Nowadays I fear you would have to wander many miles from Koroit to find any trace of native Orchids; but it was not so then. The virgin forest which in those times clothed the steep banks of the volcanic lake of Tower Hill, and the bushlands to the north of the village, were a paradise of wild-flowers. And among these, two Orchids were my favourites: a large and richly-coloured form of *Caladenia Patersonii* ("Spiders"), and the lovely *Diuris longifolia,* with its perfect blend of yellow, brown, and purple. These were my first loves among the Orchids, nor have they ever been despised among the multitude of their relatives which have come my way since.

After Koroit, for nearly eight years I was at school at Geelong. All "Old Boys" of Geelong Grammar cherish the memories of School Saturdays, when we were allowed the whole day off for long tramps into the bush, or long voyages down the Barwon River. (We thought nothing of leaving the school boatsheds between 4 and 5 a.m., rowing 12 miles down to the Connewarre Lakes before breakfast, and then continuing another 10 miles to Barwon Heads, rowing back the 22 miles in the evening and reporting ourselves by 8 p.m. They do it still down there, I believe.) My juvenile botanical proclivities were stimulated at Geelong by the great headmaster of those days, John Bracebridge Wilson, himself widely known in the botanical world for his work among the *Algae* of Port Phillip. Mr. Wilson warmly encouraged all indications of interest in natural history among his boys. Those of us who were botanically inclined used to bring our treasures from the bush to him on Saturday nights to be identified; or sometimes he would lend us Mueller's "Key" and, with a few hints, teach us to track down our plants for ourselves. In those Geelong years my knowledge of Victorian Orchids increased considerably. *Caladenia, Pterostylis, Diuris, Thelymitra, Calochilus,* and *Corysanthes* are the genera that I remember best in thinking of those school-day rambles of over half a century ago. *Corysanthes,* I recollect, was dubbed by one of my mates "Sitting-down Orchid"; and the nick-name was very apt.

Next came Trinity College at Melbourne University. But in the meantime my father had long since left Koroit on his appointment to Coleraine, still in the Western District, but about 60 miles further inland, and not a great distance from the Grampians. I have alluded in a previous article to my early association there with the Moodie family at Wando Dale. During University terms such time as I could spare was devoted to exploring the wild-flower lands of eastern Port Phillip and adjacent areas. At Fern Tree Gully in the Dandenong Ranges I was introduced to my first epiphyte; and not all the thrills of northern brush forests which I have felt since then surpassed the excitement of that first sight of the gem-spangled little *Sarcochilus parviflorus* clinging to the *Coprosma* shrubs in Fern Tree Gully. About this time I had another introduction of a different sort. Mr. Bracebridge Wilson, whose wife was my aunt, gave me a letter to no less a personage than the great Baron von Mueller. With feelings of awe I ventured to approach his residence at South Yarra, and was somewhat disappointed to find it so far short of the baronial castles of romance. To my embarrassment, the front entrance was so effectively barricaded with a heterogeneous assortment of packing-cases that I could not reach the door; and was compelled to go round to the back. A very ordinary lad came to the door, and took my letter in. Presently a funny-looking old bearded gentleman, clad in an untidy dressing-gown and with a woollen scarf round his throat (it was a warm day), came out holding the letter. "You are from Mr. Vilson? Come in, come in! Anyvon from my vriendt Mr. Vilson is velcome here!" And I followed him into a bare and comfortless room where he was at work on innumerable specimens, and where he immediately produced for my consumption lemonade and biscuits. Then he began to talk about Australian plants. It was apparently of no consequence to him that a callow young 'Varsity undergraduate had interrupted important work; he would not let me go. He emphasized the unique character of our *Flora* and how much worth while it was for young Australians to study it. He offered to help me, asked me to write to him and send him specimens, and finally presented me with a fine assortment of seeds of various kinds. The dear old Baron; eccentric he may have been, and maybe a trifle ruthless in substituting his own botanical nomenclature for others; but kindness overflowed from him. I still cherish a few of his letters. He died about eighteen months after I first met him.

After leaving the University I received Anglican Orders in the diocese of Ballarat, and for the next five years lived near Colac in the Western District. My work lay to the north of that town, and it was only rarely that I had opportunity for a trip down into the Cape Otway Forests, now I believe largely cleared, but in those days mostly virgin forest of magnificent type. On the north of Lake Colac were miles and miles of open grassy plains, excellent for farmers and graziers, but offering little attraction to a botanist unless he were inclined towards agrostology. I think I found about a dozen small species of ground Orchids there in five years.

Then came a great change for me; I accepted the offer of the curacy at Tamworth in Northern New South Wales. My Vicar, the late Archdeacon T. K. Abbott, proved not only a staunch friend, but a friend who gave me generous and sympathetic encouragement in my love of botany, though no botanist himself. At once I found myself among many strange plants, Orchids and others. Mueller's "Key to the System of Victorian Plants" was of little use. So I wrote for advice to the Government Botanist of New South Wales, the late J. H. Maiden. He replied at once, recommending me to procure Moore and Betche's "Handbook of the Flora of N.S.W."; offering to assist in the identification of anything I might be unable to track down for myself; and asking as a favour if I would kindly try and send some specimens of the district Flora for the National Herbarium in Sydney. For the next twenty-two years, i.e., until his death in 1925, I can truly say that Mr. Maiden was my "guide, philosopher, and friend," in all things botanical. I think I am right in saying that except on one or two occasions when he was ill, every letter I wrote to him (and they were many) was answered by him personally. I can never express what I owe to him. Perhaps I may say without being accused of egoism that in the past fifteen years or so, I have been able to add something to our knowledge of Australian Orchids; but I doubt if I should ever have begun to put on paper, with a view to publication, what I was learning, had it not been for Mr. Maiden's encouragement and urging. It was a very real pleasure to me during those years, to know that I was doing him some service, wherever I happened to be living, by collecting and sending specimens for the National Herbarium.

From Tamworth I went to Warialda, on the far North-western slopes of the New England plateau.—(*To be continued.*)

● ***Contributions from the National Herbarium of N.S.W.*** In the issue of this periodical dated January, 1941 (but not published till March), the Rev. H. M. R. Rupp describes two new Orchid species for New South Wales, *Diuris rhomboidalis* and *Pterostylis longicurva*, both occurring chiefly on the western slopes of the Dividing Range in the north of the State. *Diuris rhomboidalis* is a tall, slender species, the individual flower superficially resembling that of *D. pedunculata*, but smaller, and in a more definitely racemose inflorescence; the somewhat rhomboid labellum is quite different. Colour, light yellow. *Pterostylis longicurva* is named from its long, much-curved labellum. It appears to have affinities with *P. reflexa* and *P. alata*, but is sufficiently distinct from either to stand on its own merits as a species. Both these species are illustrated by line-drawings.

The writer continues the article with an account of the discovery, in the National Herbarium, of New South Wales specimens of Rogers' and White's *Zeuxine attenuata*. These had been labelled some years ago as Blume's *Cheirostylis grandiflora*, but Mr. Rupp found them irreconcilable with Blume's plate and detailed drawings of this Orchid in his *Orch. Archip. Ind.*, and with other descriptions. On the other hand, so far as the scanty material allowed of careful examination, they appeared to agree precisely with Rogers' & White's description and drawing of *Zeuxine attenuata* in *Proc. Roy. Soc. Q'land, xxxii, No. 9, p.* 123. Two of the specimens were found on the Richmond River, and one on the Clarence River. As neither *Cheirostylis* nor *Zeuxine*, at the time of the discovery of these plants, was known to be represented in the Australian Orchid Flora, and as the two genera are not far apart and there was little or no material available for comparison, the mistake in the first determination can easily be understood. The Richmond and Clarence specimens are the only records of *Zeuxine attenuata* south of Mackay, Queensland.

"This Water Shortage." In Sydney and its suburbs, the year 1940 has been a very anxious one for all gardening folk, including Orchid growers.

Paradoxical as it may seem, despite one of the wettest summers on record, in which copious rains have fallen throughout the State, 1941 finds us still in the midst of a serious restriction in the use of water for our favourite plants.

Beneficent Nature, however, maybe by way of compensation for our tribulations, has sent us a season that has been gentle with us at Willoughby, on the northern side of the Harbour. There have been no extremes of temperature, which has remained in the seventies almost throughout the entire summer.

Rain, too, little and much, has fallen each week, creating an unusually humid condition resulting in a remarkable growing season which has not been equalled during the eleven years that I have been interested in Orchids.

But for this beneficence of Nature, instead of hundreds of grand plants and thousands of beautiful blooms, I fear that these favourites would have become but a memory and their quarters a graveyard.

Dendrobiums and *Cymbidiums* in the open have made astonishing growths and are splendid, although the larger plants have received a watering only about half a dozen times in the past four months.

Surely, then, there is this lesson to be learned by those of us who grow our Orchids in the open — that atmospheric and climatic conditions play a very large part in their welfare and vigour.

Already, however, it would seem that a note of warning might well be sounded to beware of misplaced confidence, and wait for a normal growing season before allowing enthusiasm for our pet fads, and cultural theories on composts, temperatures, time of watering, no water, fertilizers, etc., to run riot, crediting them with results that are almost entirely due to a wonderful season.

W. B. WORTH,
Willoughby, N.S.W.
14/2/1941.

CYMBIDIUM CANALICULATUM, *R. Br.*

Growing on a Eucalypt near Coonabarabran, Western N.S.W. (over 200 miles inland).
Photo by the late Miss Una Suttor.

CATTLEYA LABIATA, *Ldl.*

A good type, the sepals being rigid and free from curling back. A hardy species flowering in the late summer or early autumn (March and April near Sydney).
Grown and photographed by A. B. Porter.

A Tribute and Good Wishes from Hawaii

To the Honorary Editor,
"The Australian Orchid Review."

Sir,—As a subscriber to your publication (through your London agents), I wish to congratulate you for your excellent work in turning out such a splendid publication. It is really, by far, the finest publication on Orchid culture which is turned out at the present, without exception.

I have subscribed to several other Orchid publications for years now, and I still do, but there is such a difference between the material which is incorporated in the various other publications and the "Australian Orchid Review." Your articles, dealing with one subject, or some particular plant, or species, make it so very interesting and readable. As a reference, having to do with some particular phase of growth, fertilization, watering, or condition, it can be relied upon as a practically authentic source of advice regarding the question involved. It is so variant in the subjects covered that any person attempting Orchid culture and also those who have had experience, cannot afford to be without a complete set of your books. Through your London agents I have a complete set of the A.O. Review and I have just had them bound, and I prize them very much. I have just remitted my 1940 dues, also 1941, and I have asked the agents to have my 1941 copies sent direct to Hawaii instead of the roundabout manner previously. I have no doubt but that you will hear from them soon.

We have a very live Orchid Club here in Hawaii. We have bi-monthly meetings at which members bring along plants in flower and also plants which may show signs of distress. A free discussion is held, and suggestions for the care and improvement of plants are given by those who may feel confident to do so. At certain periods during the year free exhibitions are given of Orchids then in bloom. These exhibitions are sponsored by various business firms who give over their office floor space or departmental store counters. These exhibitions have been very popular with the public. No admission is ever charged but we are getting the average person to become Orchid-minded and there is hardly a home that has no Orchids growing in one form or other.

At the annual flower show and country fairs the Orchid Club takes active part in exhibiting such plants as may be in bloom. This is the only section which is held non-competitive, and the tables usually attract a goodly crowd.

Well, Hon. Editor, I started off with the intention of just giving the "Australian Orchid Review" a well-deserved boost, and here I have given also a little history. Meantime I will close, and with all good wishes for the Orchid growers "Down Under," and for the continuance of the "Australian Orchid Review."

Yours very truly,
ALEX. ANDERSON,
President, Hawaii Orchid Club,
Papaikou, Hawaii.

● ***Orchidaceous Weather Prophets.*** An Orchid grower visited me one Sunday afternoon. "Look at those roots," said he; "I always find that when in that condition they indicate early rain."

The roots were plump and healthy, their tips being almost transparent and spongy with moisture.

The roots referred to were the aerial roots of *Dendrobium nobile* and *D. thyrsiflorum*, but no doubt the roots of other *Dendrobiums* would be similarly moisture-laden.

The humidity was high for two days, rain falling the following Tuesday.

Observations on these unsuspected weather indicators should prove interesting, but the old bunions, corns, and the meterologists are not likely to be supplanted as short range forecasters by these Orchidaceous weather prophets.—W. WORTH, Willoughby, N.S.W.

● Mr. N. MacDonald has installed a 2000-gallon galvanized tank to store rain water in for his Orchids. It is coated inside with a preparation to counteract corrosion and the ill effects of the galvanized iron. The water is caught from a slate roof; a corrugated iron roof is not suitable for the purpose. The water is supplied to the houses through one-inch piping with an electrically-driven ¾-inch centrifugal pump.

● The Hon. Secretary advised having, some time ago, flowered *Broughtonia lilacena*. After all the flowers had died, the plant was suspended in a corner of the glass house, but for some reason the flower spike was not cut off. Three months later the old flower spike again flowered from the tip and is also branching out in several places lower down. This habit is mentioned for the information of other members who may have the species.

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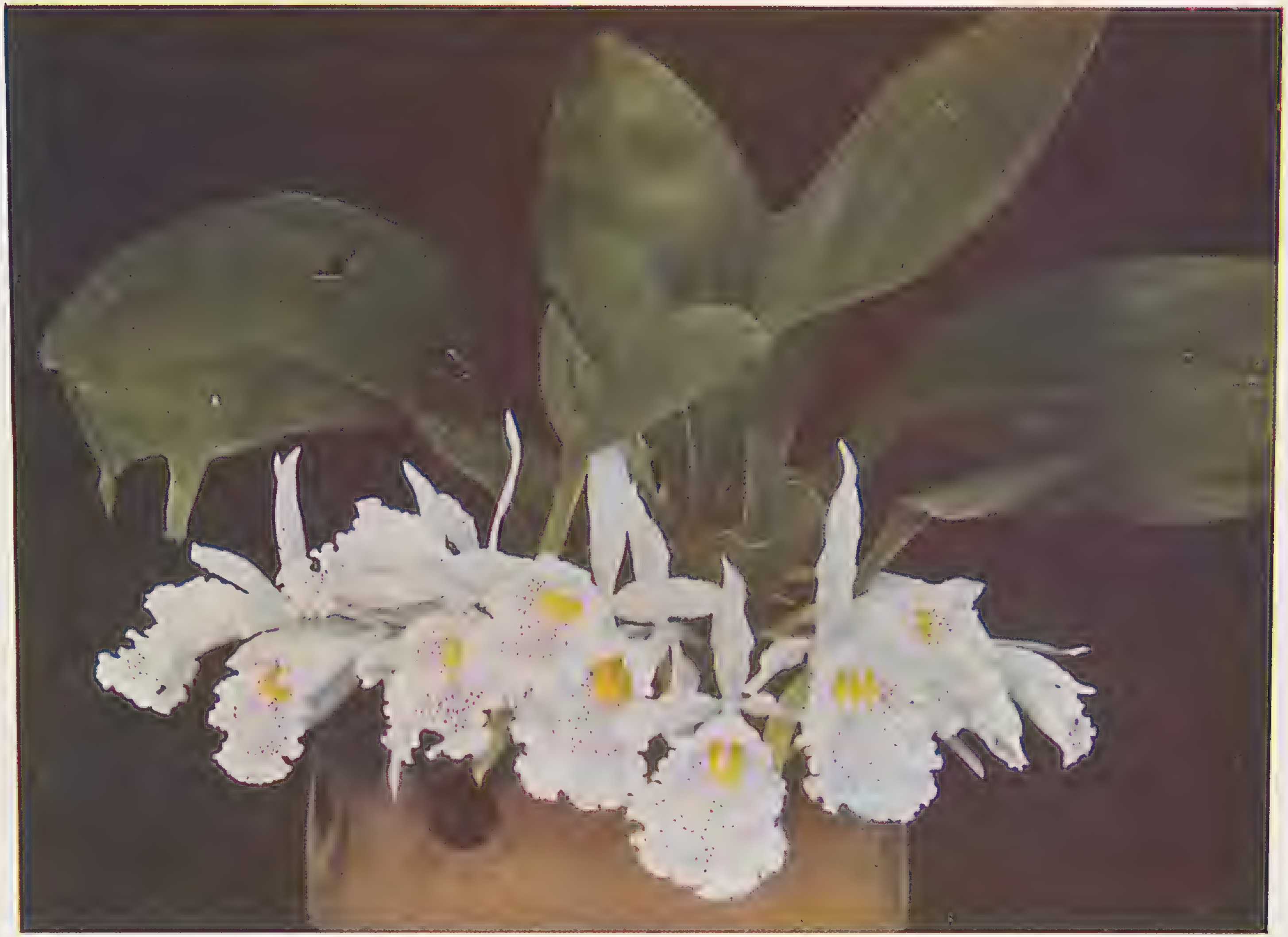


TRICHOPILIA SUAVIS Ldl. x Paxt.

Australian Orchid Review

Editorial

Patience in Orchid Culture

● No leisurely pursuit requires more patience to make a success of it than horticulture, especially that branch which specializes in the cultivation of Orchids. The habits of growth and florescence of Orchids are different from those of the average garden plants and, with few exceptions, Orchids require particular treatment.

The physiology of assimilation of Orchids, for instance, is somewhat different to that obtaining among the usual series of cultivated plants, and particularly applies when comparing the growth of hardy annuals which rapidly grow, producing crops of flowers, fruit, or seed within a short growing period. Hence, the novice with outdoor gardening experience, who wishes to include the cultivation of Orchids in his horticultural activities, must quickly learn that he is not dealing with poppies or cabbages and the like.

The pests in the open garden are numerous enough now to demand the constant vigilance of the gardener, but are more easily approached than those in the bush-house or glass-house. The garden lends itself more readily to systematic baiting for snails and insects, while insectivorous birds help in keeping caterpillars and moths, grubs and beetles within bounds. Sundry natural agencies, such as frost, rain and an arid wind also further assist in buffeting the pestiferous intruders.

With a mixed collection of Orchids in a glass-house, all the agencies mentioned are eliminated, the grower having to pose as a collection of natural laws rolled into one and, unless he is armed with infinite patience, he is likely to break down before he has realized his ambition of being a successful Orchid grower. Systematic inspection and prompt attention will generally reduce the multiplicity of pests to impotence.

There are several other matters that require a fair amount of patience in their application. The use of liquid and solid organic or inorganic manures is one of them. Manures in the hands of an expert who "knows his Orchids" are decidedly beneficial, but for the novice who has not completely mastered the principles of potting and seasonal cultivation, manures are best left alone, relying on more frequent potting with clean, wholesome compost.

Another item that requires a little patience is the cultivation of back bulbs or back cuts, and other dormant units of propagation. Some *Dendrobium* and *Cattleya* pseudo-bulbs will remain green up to three years, so do not throw them away if they do not shoot the first season after severance. While there is greenness there is life.

Patience, too, is requisite in handling newly imported Orchids. Do not force them or over pot them. Rather give them a humid atmosphere, awaiting the appearance of shoots and roots before potting them, to regain seasonal balance and vitality. The novice also becomes impatient with small plants of a single growth, which are several years in reaching the flowering stage. It is a recommendation to the beginner to buy a plant of a reasonable size, containing an extra growth or two; the plant is then able to support the lead when it decides to flower. Patience in all things appertaining to the cultivation of Orchids

Whys and Ways of Orchid Culture

PART 3—"LIGHT"

J. MURRAY COX, *Brisbane, Q.*

● I suppose we have all, at some time or other, seen the gradual break of day—how, through that deep darkness which precedes the dawn, comes a wavering finger which seems to wipe away a little of the blackness from the eastern horizon, and how this little clearing grows from green to rose, purple and gold; and as the light grows stronger, objects on the skyline turn from vague masses into grotesque arabesques, then to silhouettes, and finally into their every-day forms. Then the sun appears above the horizon and brings to life all that complex melange of vice and virtue, hypocrisy and honesty, peace and conflict, which makes up life.

It is little wonder that the sun held a high place in the religious beliefs of the ancients. Among the primal people it was thought that it was something like a glorified electric light (though, of course, they had no conception of an electric light as such) which was switched on at dawn and off at dusk, with the sole function of giving light to the world. With the development of speech and the establishment of the written word, first by hieroglyphic symbols or pictures, and then by letters which had a constant value, the thinkers of the early civilisations began to ponder on the causes of things. They realised that there was some form of law or influence that controlled the development of earthly things, and, not understanding the why and the wherefore thereof, they ascribed this unknown power to various supernatural beings which, for the sake of clarity, we call Gods. It was realized that the sun was something more than a lighting apparatus, and that it had some mysterious control over the development of the plants and animals of the world. Hence, in most of the primitive religions the Sun (under various names) was looked upon as the chief of the Gods. This belief was spread over practically the whole of the world, for the legends of the peoples of Scandinavia, Egypt, many parts of Europe, America, and Asia, give evidence of a sun-god who, in most cases, was regarded as the creator and propagator of life. In the light of modern knowledge there was more than a scintilla of truth in those old beliefs.

With the growth of this belief in a sun-god, there arose the doctrine of appeasement or sacrifice, and it was a normal part of their ritual that on certain days of the year, usually at the equinoxes, the longest day of the year, and the shortest day that human sacrifices were made to this great god of fruitfulness. These sacrifices were generally festivals during which a good time was had by all—except, of course, the star performers at the party, who always came to a sticky and, generally, a painful end. There may be some analogy between those ancient sun-worshippers and those of our day in which thousands of individuals voluntarily submit themselves to the torture of sunburn as part of the ritual of a form of sun worship when lying unclothed upon highly reflective beaches.

A cynic has said that language was invented by man to conceal his thoughts, but the development of the avenues of communication has lead to the advancement of knowledge.

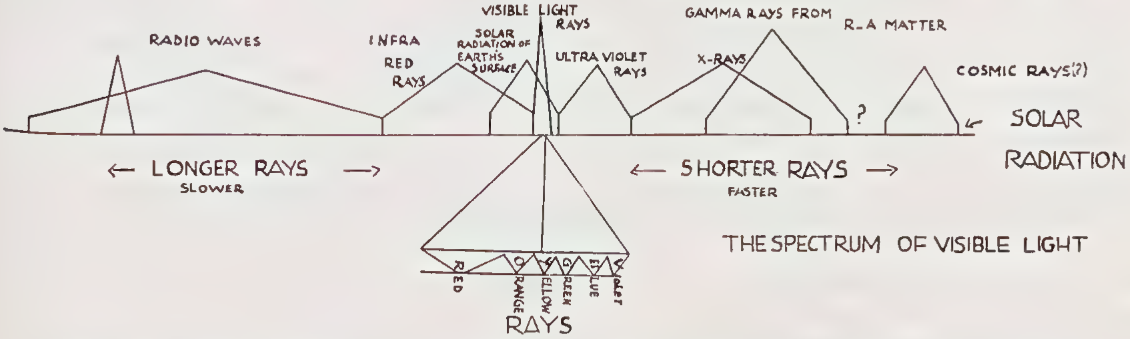
So, as communication between the wise men grew, knowledge was gradually dispersed among the old civilizations and, with the growth of new ideas so born, the old empires fell and gave place to new. Hence the old Chaldean, Persian and Egyptian Empires were succeeded by the Greek, the Carthaginian and the Roman Empires, and during these new eras philosophy was born and grew, and logical consideration of the physical facts of the universe began to be recorded. It was soon realized, that while the sun had much to do with the growth of plants and the ripening of crops, its influence was not of a supernatural nature, but was physical or chemical in its action.

The early Christian era preceded and followed the fall of the Roman Empire. In this stage of the development of civilisation most of the ancient knowledge was repudiated and forbidden. Right up to medieval times the Church had practically the sole control of education and thought, and any attempts to pry into the unknown were regarded as dealings with "the devil," and were suppressed by the invocation of curses, with all the dread ritual of bell, book and candle, and by the infliction of physical torture and death. But while the Church was refusing any adventure into the unknown, it was sowing the seeds of the growths which later would strangle its power, for it was imparting the rudiments of reading, writing and numbering to the children of its adherents, and when the fruit of the Tree of Knowledge is eaten, its seeds fall to the earth and germinate and grow. With the Renaissance there came a fresh growth of speculation and investigation into the phenomena of the earth, and, although most of these early researches were abortive, some of them survived to form the basis of modern science.

Among the many phenomena to which thought was given in those early times was that of "Light." Many theories were evolved regarding the nature of the sun's rays, but the first man to give any practical pronouncement was the great English Scientist and Mathematician, Sir Isaac Newton, of whom all that most of us know, is the legend that an apple struck his head, and as he couldn't find anyone who threw it, he invented the Law of Gravity to explain the event. Newton made many experiments with lenses and prisms, and he demonstrated that white light—the light which we see and which we know comes from the sun—was not an intangible essence but something which has physical attributes, and which could be divided into various constituent parts—and from the further investigations which have followed upon Newton's work right down the centuries to the present day, we know that the sun's rays can be weighed and analysed and controlled, like all the other phenomena which make up our wonderful universe.

As a result of these investigations, we now know that visible light is but a fraction of the constant radiation from the sun—how small this fraction is can be seen from the diagram shown. This gives some idea of the composition of the rays as they leave the sun. This radiation is made up of a number of different waves of varying length and intensity or speed. Not all the rays which make up the sun's radiation reach the earth. If they did happen to do so, even for so short a time as one second, it is likely that every living organism on the earth would be destroyed, and possibly our planet itself would be burned to ashes. Fortunately (or having regard to the mess into which humanity has got itself, perhaps unfortunately), most of these rays are absorbed first by the comparatively narrow belt of ozone which lies like a blanket round our atmosphere, second by the atmosphere itself, and third by the clouds, dust, vapour and other impurities which, though unseen, crowd the air about us. As the result of these barriers only a very limited number of rays outside the visible rays succeed in penetrating through to the earth's surface—and these invisible rays are a fraction of the infra-red rays, and a fraction of the ultra-violet rays—modifications of each of which are represented by the red and violet rays which comprise the two ends of the spectrum of visible light rays as shown in the enlarged section at the bottom of the diagram.

We know that the solar energy received by the earth is not constant insofar as it differs in different parts of the world, and at different times of the year, not only in its duration, but in its intensity and its quality. Thus at the equator we have days which are divided almost equally into darkness and light, while in the distant latitudes we find that in summer the days have light for anything up to 24 hours and in winter they are in darkness for the same time. Then, again, the intensity of the sun's rays is affected by the angle at which they reach the earth—if the sun is directly overhead the rays have a much greater intensity than if they are striking obliquely at the earth's surface for the simple reason that in the latter case they have a greater depth of atmosphere, etc., to penetrate, and so more of their force is absorbed.



VISIBLE LIGHT RAYS REACHING THE EARTH AT THE RATE OF 392 TO 727 BILLIONS PER SECOND

Therefore, the intensity of the sun's rays is greatest in mid-summer from the annual aspect, and at noon during the diurnal period. The exact difference of intensity at different periods and times have been calculated and demonstrated, but they do not concern us in this paper.

In our paper on the "Nutrition of Plants" (No. 2 of this series), A.O.R., Vol. 4, No. 4, we saw, by a process called photo-synthesis how the leaves of our plants manufacture certain sugars from the carbon dioxide of the atmosphere and the water within their stems, through action of light upon their chlorophyll cells and that, by processes not yet completely understood, these sugars are converted into starch or mucilage and other carbohydrates, and into proteins, organic acids, fats, and so on. It is obvious, therefore, that light of some sort is essential to the growth of every plant. For some years this relationship between light and plant life has been the subject of scientific investigation.

Experiments have been made in specially constructed chambers in which heat and moisture were controlled, and which were so screened that certain rays could be blocked while others were permitted to enter the chamber. These experiments were not only conducted with sunlight, but with various forms of artificial light such as mercury arc and tungsten lamps. The compilation of the results from the data obtained has not been completed, but it would appear that the red rays are the most promotive of growth, the blue rays next best, while the green and yellow rays are useful—but the infra-red and the ultra-violet rays contribute nothing to the growth of the plant.

Investigations into the relationship between light and the flowering of plants have been carried on for some years, particularly by Dr. Garner and Dr. Allard, of the United States Department of Agriculture, and as a result of these inquiries, it has been demonstrated that the production of flowers in many types of plants may be increased or reduced by the regulation of the daylight available to them. A number of plants are not noticeably affected, but the majority fall into one of two groups: (1) "long-day" plants, and (2) "short-day" plants.

In the case of the long-day plants, it was shown that, in order for them to produce flowers at all, they must have a certain minimum daily exposure to sunlight. If this critical light period was increased, the flowering stage was reached more rapidly, and the quantity of flowers produced was increased—and this improvement was continued by increasing the period of light up to a maximum, after which no further improvement was noted. In fact, a tendency to deteriorate was noted in some instances, and in others for an increase of foliage growth at the expense of the flowers.

When the light periods were reduced below the critical period there was a cessation of flowering and a retardation of growth.

In the case of short-day plants, the results were practically reversed. An increase of light over the critical period tends to reduce or prevent flowering, while a reduction of the light period increases the quantity of flowers and hastens the flowering period. Experiments with artificial lights had similar results.

Now, as far as I can ascertain, no experiments have been carried out under research conditions with Orchids as their subject. Just before the war broke out I made arrangements for the supply from America of certain lamps which emit various rays—red, yellow, blue, etc., with the intention of conducting experiments with Orchids along the lines mentioned, but unfortunately, as a result of the hostilities, I was not able to obtain them. However, when happier times return, I hope to be able to go ahead with my plan. I am quite confident that "light" has a big bearing on the difficulty which we find in flowering certain Orchids.

Whether a plant is a long-day or a short-day plant depends almost entirely upon the physical conditions of its native habitat. Thus of two plants growing naturally on the same parallel of latitudes, one may be a short-day plant and the other a long-day plant, because the first may grow in a deep gulch into which the sunlight may penetrate only for an hour or two each day, while the other may live high on a tree, or a cliff, exposed to the sun's rays for many hours each day. It is desirable, therefore, that we ascertain as nearly as we can, how each of our Orchids grows naturally, particularly in the case of species. Thus, if we know that *Vanda suavis* grows in Java on trees in the shade of other trees, and that *Vanda tricolour* also grows in Java, but grows upon stunted trees which allow the full light of the sun to play upon it for the greater part of the day, it will require no great amount of intelligence to decide that *Vanda suavis* must be grown in a somewhat more shaded position than *Vanda tricolor.* But if we are having difficulty in flowering either or both *tricolor* and *suavis,* it may puzzle us to know the reason. Assuming that our attention to temperature, moisture and nutrition has been in accordance with the known requirements of the plants, we will be justified in looking into the matter of the lighting conditions in which they are growing.

Java, of course, lies in the equatorial zone, and hence has days which are divided practically equally into darkness and light all the year round. Here in Brisbane we are right outside the tropics and, therefore, our days are considerably longer in summer time than in the winter. The winter period is the time when these *Vandas* are getting ready for their spring and summer flowering. From their manner of growing on trees in the tropical belt, we know that they are both probably "long-day" plants, and that in their natural haunts under the influence of the warm long tropical sunlight, their chemical functions are working at high pressure right through the winter. Therefore, it will probably assist the plants to flower in the next spring if we move them so that they get the maxium amount of sunlight during the winter months—always remembering that *suavis* can do with a little less sunlight than *tricolor.* I have chosen these two *Vandas* for this example because, as a general rule, they are very easy to flower in Brisbane, our climatic conditions meeting their requirements reasonably well—and yet from time to time we hear growers say: "I can't flower *suavis,*" or "my *tricolors* never do as well as so-and-so's," and so on. The failure is most probably due to a deficiency of light during the winter period.

Cattleya Warcewiczii or, as it is usually called, *gigas,* is notoriously hard to flower. This *Cattleya* grows high up on the Andes, principally in the Republic of Columbia which, again, is right in the centre of the equatorial belt. Here it grows upon the sparsely-leaved trees, and even on the high, almost inaccessible cliffs nearly 8,000 feet above sea level, where it is exposed to the four winds of heaven, and to the full force of the tropical sun. Under these conditions it flowers regularly and abundantly every spring. Yet, transferred to our sub-tropical climate, and given all the refinements of Orchid culture, it often refuses to show a sheath, although it grows rapidly. I am confident that this is largely due to the difference in light hours—and that if we could find a means of increasing our hours of light during the winter—*gigas* would present no more difficulty than any other *Cattleya,* particularly in the cooler climate of Sydney.

Again, the terete species, *Vanda teres, V. Kimballiana* and *V. Hookeriana,* and the hybrid, *V. Agnes Joachim* are often shy bloomers here, whereas, in their habitats, they flower prolifically. Here again, I believe the secret lies in this matter of light. As far as I can ascertain, all those who have flowered these plants have either grown them out in the full sunshine or the plants have bloomed only when they have grown up through the roof of the bushhouse.

So, if we have any Orchids which we find exceptional difficulty in flowering, it will pay us to consider closely how we are treating them in this matter of sunlight. If they are already growing in the sunniest part of the bushhouse, and have made good growth, it is possible that they are getting too much light in summer, and it will probably pay to shift them into a more shaded part of the greenhouse during the long days of that season. If, on the other hand, they are in a shaded part of the house, then the obvious thing is to move them to a sunnier place—making this move during the autumn or winter.

In any case, we should always increase the light available to our plants in the winter time, if possible, by removing battens or by otherwise decreasing the overhead covering.

Another important feature of light is its relation to colour. It has been well authenticated that plants which flower in the high altitudes produce more brilliantly-coloured flowers than those of similar species which grow nearer to sea-level. This is attributed to the fact that in the high altitudes there is a greater amount of the ultra-violet rays in the light. I have had an experience with *Vanda coerulea* which, no doubt, has occurred to other Orchid growers. This plant grows on low shrubs and trees with plenty of sunlight, at altitudes ranging from 3,000 to 5,00 feet. Certain plants of this species flowered very shortly after arrival from India, the flowers being a deep blue in colour. Next year the flowers were still blue, but a lot paler in shade, while the third year they were almost white. Now, it seems that the so-called "dark" variety is only found at the highest part of the plant's altitude range, whereas the paler hued types are found at the lower elevations. This seems to me to indicate that there is no such thing as an inherently dark-flowered or light-flowered variety of *Vanda coerulea,* and that the differences in colouring in the various plants are merely coincidental with the elevation and light conditions of their habitats. It seems to me, too, that much of the difficulty associated with the growing of this plant lies in the fact that we try to grow at an altitude of 15 to 50 feet a plant which is accustomed to the lighting and atmospheric conditions of 3,000 to 5,000 feet.

Another experience of the changing of colour happened to me with a plant of *Dendrobium Kingianum.* The plant came from near the top of Mt. Cordeaux (about 4,000 feet), near Cunningham's Gap, where I found it growing in a great mass upon basaltic rock. The blooms were a very deep crimson purple, definitely the deepest shade I have seen in the species. When it first flowered for me it was still a good, deep colour, but appreciably lighter in shade. Now, after five years, its blooms are the typical pale pinkish lilac—no different from those found in the low-lying scrubs near Brookfield. This change of colour can surely be due only to one of two causes: (1) change of altitude and consequent variation in light value; (2) absence of some agent in its food—such as iron, manganese, etc., which may affect the colouring in the same way that hydrangeas and other flowers are said to be affected by the addition or removal of some element to or from their soil. But I am inclined to think that it is the lessening of the ultra-violet rays in the sun-light of Brisbane that is responsible.

The principal factors in the growing of Orchids are nutrition, temperature, moisture and light, and we must remember always that the importance of any one of these factors is relative to the other factors. We cannot say that the feeding of Orchids is the most important element in their cultivation, nor are temperature, moisture or light, paramount in importance. We should strive to provide a nicely judged scale of treatment for each plant according to its needs and according to the conditions available to us. If we restrict our efforts at Orchid-growing to those plants whose requirements most nearly meet what we can give them, we shall have a vastly higher percentage of success than if we try to grow a large range of species without giving consideration to their requirements. The fact that we grow Orchids is an indication that we are plant lovers, and it is a poor sort of plant lover who will subject a beautiful Orchid to a miserable existence and a lingering and painful death just for the sake of including such a plant in his collection.

There are scores, even hundreds, of Orchids which thrive under quite ordinary conditions in bushhouses and glasshouses, and if we restricted our efforts to these we can build up large and interesting collections which will give us worthwhile results all the year round. We can then leave to those who can provide the extra requirements, the plants that require specialized treatment. By doing this we will save our purses and our self-esteem from some nasty shocks.

We know that *Dendrobiums* and *Epidendrums* are almost all lovers of sunlight, and in their natural state grow under conditions where they have the direct rays of the sun beating upon them for some hours each day. *Cymbidiums,* too, are light lovers, but they grow either upon the trunk of the host tree, or on branches close to the trunk, so that they get ample light, but this is diffused or broken by the foliage above them. *Cypripediums* are mostly terrestrials and tend to grow in the jungles of the tropics where their sunlight is broken by the overhead growth. There are exceptions, of course. *Cypripedium Lowii,* for example, grows high up on trees like a *Dendrobium,* while *C. Spicerianum* is often found growing upon rock faces exposed to morning sunlight. *Cattleyas,* which come from the Andes, require greater sunlight than those which originate in the Amazonian jungles —and so on. Hybrids tend to inherit the characteristics of their parents, not only in regard to physical features, but also with regard to cultivation needs. These hereditary traits, however, are modified by the artificial conditions in which they are raised. But whether your plants are species or hybrids, they must be kept clean. If the leaves are coated with a film of dust or soot or scale, this film will act as a screen which will prevent the light rays from reaching the leaves, so that the intricate apparatus by means of which the plant manufactures its foods will work imperfectly. Instead of a virile healthy plant, you will find you have a weedy, sickly specimen which will be unable to resist the attacks of disease and pests, certainly never flowering satisfactorily, and almost certainly will soon die. Keep the leaves and stems of your plants fresh and clean by frequently spraying or hosing them, give them plenty of fresh air and reasonable light, and you will find they will amply repay your trouble.

It all boils down to this—to grow Orchids successfully you must use your brains. The road to success is steep and rutted, and there are many traps for the unwary along it, but if you make the grade and avoid the traps, and keep out of the ruts, you will have a satisfaction such as nothing else can give you.

A New Variety of Dendrobium from N. Queensland

C. T. WHITE, *Government Botanist, Brisbane, Q.*

● During the past couple of years, I have seen several specimens of a form of *Dendrobium Phalaenopsis* of a very compact growth. The flowers in size and form are similar to those of *D. Phalaenopsis* Fitzgerald, but the labellum is abruptly obtuse, and slightly emarginate, as in *D. bigibbum.* It lacks, however, the cluster of white glands on the disc typical of *D. bigibbum.*

Except for being slightly smaller, the flowers are identical with F. M. Bailey's *D. bigibbum* var. *macranthum,* afterwards reduced by the author to a synonym of *D. Phalaenopsis.* He described the stems, however, as identical with those of typical *D. bigibbum.* If *D. Phalaenopsis* is to be regarded as a distinct species, the affinities of both the present plant and Bailey's var. *macranthum* lie with it rather than with *D. bigibbum.*

As the distinctive feature of the present plant is its very compact growth, I am naming it, and describing it, as follows:—

D. Phalaenopsis Fitzgerald *var. compactum n. var.*

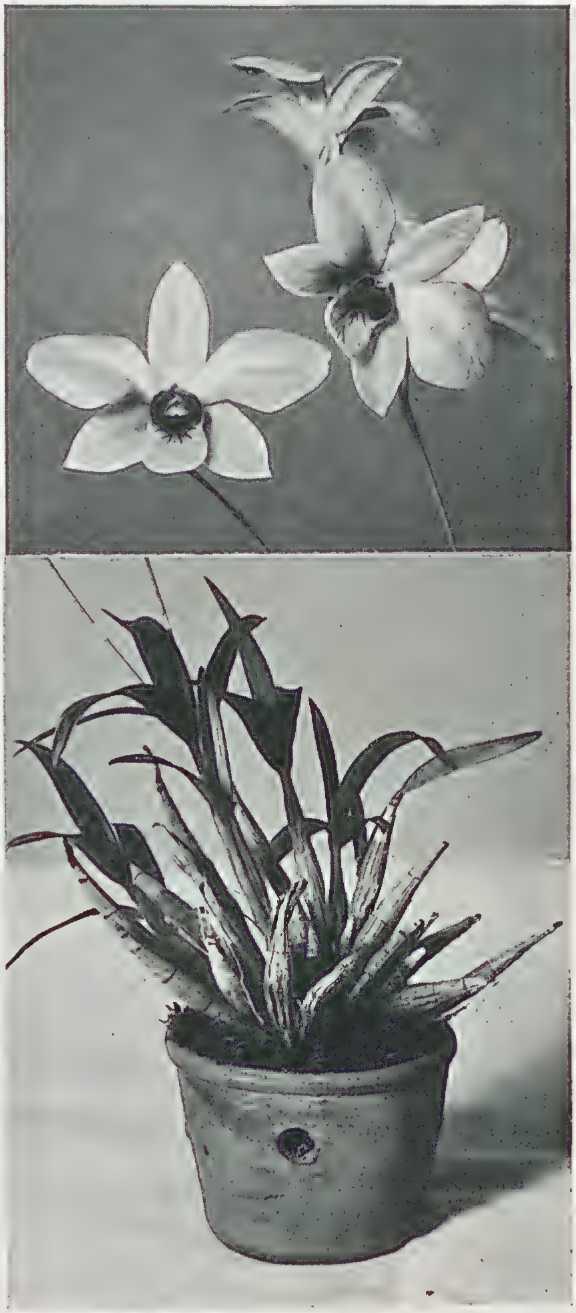
Plant of compact growth; pseudo-bulbs 3-5 inches long, half a inch or slightly more in diameter in the thickest part. Leaves, 3-4 on a stem; 1½-3½ inches long; ½-¾ inch wide. Flowers mostly 3 in a raceme, 2½ inches across, heliotrope-purple; sepals oblong, very acute, 1¼ inches long, ½ inch wide. Petals rhomboid, 1½ inches long, 1¼ inches wide. Labellum 1 inch long, middle lobe very obtuse, slightly emarginate, lateral lobes much darker in colour than the rest of the flower.

The above description is drawn up from a plant cultivated by Mr. A. Hilsden, of Brisbane, and obtained from Hartley's Creek, Qld. The illustrations are from plants cultivated by the President of the Queensland Orchid Society (Mr. V. W. A. Moller), and obtained from the Mossman River, N.Q.

To comply with the International Rules of Botanical Nomenclature, the following brief latin diagnosis is published:—

Plantata compacta. Pseudo-bulbi 7.5-12.5 cm. longi, ad 1.3 cm. diam. Folia 3-4; 4-9 cm. longa, 1.2-1.8 cm. lata. Flores plerumque 3, 6.5 cm. diam., purpurei; sepalis oblongis peracutis 3 cm. longis, 1.3 cm. latis; petalis rhomboideis 3/8 cm. longis, 3 cm. latis; labello 2.6 cm. longo, disco et lobis lateralibus atro-purpureis nitidulis.

Type: A flower in the Herbarium, Brisbane.



Dendrobium Phalaenopsis, var. compactum

Grown by Mr. V. W. A. Moller, Brisbane. Photo. by Department Agriculture and Stock, Brisbane.

Cool House Culture and Notes for Amateurs

T. H. JAMES, *Longueville, N.S.W.*

● Spring has come again, and with it our hopes for more and better blooms than in the past. The fact that our plants, or at any rate a percentage of them, has retrogressed rather than progressed, does not stifle our hopes that all will be well in the new year of growth. What an optimist the gardener is! No amount of failures seems to dampen his ardour, and even when disaster has overtaken his efforts he starts off afresh with undiminished enthusiasm. Personally, I have in my collection a few Orchids which have persistently refused all my persuasion, and are steadily on the way to the mortuary, and yet I still cling to them, hoping that some time I will succeed with them. Others have spoken to me about similar cases, and agree what an immense satisfaction is the fact of final success with a recalcitrant subject. But enough of rhapsodizing, so let us get on to practical matters.

Light: Personally, I shall have to adopt a different plan this summer. Practically all paint had been washed off the glass by last autumn, and what the birds left of my coarse scrim blinds did not amount to much, and consequently the roof was, in many places, quite clear glass and no burning occurred. Early in May the blinds were removed entirely, so 90 per cent. of the roof is clear. This course scrim is now unobtainable, so there is no option but to paint the glass. Probably the best material for this is "Mill White," to which a little oil has been added. This has the advantage of wearing very thin towards the end of summer, and can then be easily removed if desired. Hessian is, I find, sometimes used, but I consider it far too close a weave and, therefore, does not admit sufficient light. From my experience during last summer I believe that painted glass requires no blinds at all, provided the house is kept damp and the plants well watered. The painting is improved by stippling with rubber sponge or net, to admit very fine rays of direct sunlight. The bush-house, if of lath, will require no attention, provided it has not been over-run with vines, but if of tea-tree, some renewal may be necessary, but it is surprising what amount of light most Orchids will stand if they are kept moist.

Watering: At the time of writing these notes, watering looks like being a problem, and a serious one. Naturally, the advent of warm weather, and the resultant activity in plant life, necessitates water, and plenty of it. The alarming prospect at present looming may not eventuate, but if it does, many devices will have to be adopted to conserve the moisture in our pots and baskets. Baskets will be the greater problem. They should, therefore, be well topped with fresh moss, and side spaces also well filled with moss. Pots should also be topped with moss. If practicable, the pots could be placed inside larger ones to retard evaporation. Wherever and whenever possible, dip your plants instead of watering in the general way. This method has many benefits—the water which passes through drops back into the tank, and is not wasted; the watering is more effective, and will require less frequent repetition; also, and this is important, dipping expels all the air in the compost, and subsequently draining away of the surplus water, draws in a supply of fresh air with obvious benefits to the plants.

Cymbidiums and other outside grown plants could be let into the ground and topped with moss. It would be found that, in these conditions, each watering would last many days, if not a whole week. If let into the ground, place a few crocks in bottom of each hole to preserve drainage. With large collections, this would be quite impracticable, but the plants could at least be placed on the ground and close together, and the exposed sides of the outside row protected with hessian or some other material. Copious rains may render all this quite unnecessary, but the suggestions might, in any case, be of use where water is not too plentiful, or to growers who have limited time for the attention that Orchids require during a hot summer.

Under normal conditions watering will now, or very shortly, be a full time job, and I would strongly urge that, whenever possible, it be done in the afternoon or evening. I found that plan so successful last summer that it will be my regular practice for the future. Water supplied in the morning during our hot summer has mostly evaporated by mid-day, whereas, that given in the afternoon, provides the moisture necessary during practically the whole twenty-four hours. Use the hose freely, particularly over the foliage. If the drainage is good and ventilation ample, I believe it impossible to over-water *Cattleyas* and *Dendrobiums* during the hot weather.

Repotting: In all collections there are some plants which have arrived at a stage where repotting is necessary, and much of that is done in the spring. I do not believe in disturbing a plant or its root system unduly. This is one of the reasons why I prefer pots to baskets. For *epiphytes* I use fibre only, mixed with some sifted tan bark, but no moss, except as a topping. In some cases it will be found that there is ample room for further growth, but the leading bulb has reached the edge of the pot. In such cases, remove as much as possible of the compost from the opposite side of the vessel, push the plant over to that side, and pack fresh compost in front of the lead. The same pot should serve for some more years. Where it is necessary to provide a larger vessel, pass a long table knife across the inside of the pot to ease the roots from their hold. If the compost appears sound, with the roots all through it, do not disturb, but merely place it in a larger pot and pack fresh crocks and fibre round the sides. If in a basket, there is no option but to cut the roots. Rather than disturb plants in baskets which are growing well, I prefer to build out with fibre to accommodate the roots of the overlapping bulbs. If plants have grown too quickly to the edge of the vessel, and there is still unused space, a good plan is to fasten a piece of celluloid or glass in front of the forward lead, which will turn it sideways or even backwards. Also, suspend or place it with the leading bulb facing away from the light.

Back Bulbs: Now is the time to increase your plants by putting to work those otherwise useless back bulbs. I have found that three bulbs behind the lead is ample for *Cattleyas*, and two for *Dendrobiums* and *Cymbidiums*. With *Cattleyas*, a deep V cut in the rhizome is generally sufficient to start the bulb behind the cut into life. Many of my *Cattleyas* in six and seven inch pots, or in baskets, have now from five to nine leads. At the present time, several of these plants have two or three flowering bulbs, and within two years at least, most of the present leads will, at the present rate of progress, produce flowers. From three to four years ago these plants had one lead only.

Most growers seem afraid to use their back bulbs, and I have frequently seen plants with five to eight, and even more bulbs, with only one lead. With *Dendrobiums*, if the third back bulbs cannot be easily separated, or if without eyes at their bases, they should be cut completely out. They will serve no further useful purpose, and yet draw on the new roots. With *Cymbidiums*, unless division would serve to balance a lop-sided plant, the back bulbs should be removed and potted separately, as their bulk would soon overcrowd the pot.

Manuring: Many growers are giving their Orchids manure of various kinds. This is quite in order when done within reason. In fact, I believe that an Orchid, of whatever type, which has been in the same vessel without being repotted for a number of years, would benefit from the application of some stimulant. But some growers have been overdoing things and have paid the penalty in loss of plants. Some valuable *Cymbidiums* have "gone west," and a number of *Cattleyas* and *Dendrobiums* are very sick. Another grower, suspected of using manure, has a rather extensive cemetery. Generally, it would be wiser to considerably reduce the suggested strength of manures or fertilisers, and apply more frequently, unless one is working on exact scientific formulae. If liquid cow or horse manure is used, it should be strained before using, particularly for *Cymbidiums*, or otherwise the particles of manure will coalesce and form an airtight layer on top of the compost, which will then be either dust dry or sodden, with disastrous results either way. *Cattleyas* and *Dendrobiums* which have been overdosed with manure will show the effects by the browning of root ends, and consequent cessation of further root action.

Cattleyas (*see general notes*): I have had trouble with a few *Cattleyas* which have refused to break into new growth until well into December. Consequently, the bulbs are so late in maturing that flowers open up in winter. This would not matter with a heated house; in fact, it would be a benefit to have flowers during the off season. But without heat, the flowers will not open fully. My problem will be to induce early growth. As a trial, they will be well watered and placed up against the glass in the warmest spot available.

The winter so far (mid July) has been comparatively mild, although frequently the thermometer has been in the lower forties. Many of my *Cattleyas* are already starting into new growth, and rooting freely. Strange as it may seem, many of my *Cattleyas*, even after very cold winters, repeatedly break into new growth ahead of those in heated houses.

Dendrobiums (see general notes).—During September and October most of the *Dendrobiums* make their generous display of bloom. To me it is rather surprising to find quite a number of collections which do not include this genus.

The best cultivated *Dendrobiums* so far seen were planted in pure leaf mould and grown in a tea-tree covered structure quite open on one side. The bulbs were exceptionally long and thick with promise of abundant flower. The results were there to see but the plants had not been in that mixture a lengthy period and I am uncertain whether their condition would be equally vigorous after 3 or 4 years when the leaf mould had broken down and become too solid for aeration. There is no doubt that leaf mould contains much that is necessary for Orchid growth, but unless it could be completely renewed at regular intervals, I think the nutriment contained would soon be exhausted and the roots shut off from free access to air. Ultimately these factors might adversely affect growth. My theory may be quite wrong as I have had no actual experience with leaf mould as a compost, although I have used pure peat moss for both *Dendrobiums and Cypripediums.* Peat moss functions quite well for a while, but later breaks down into a soil, and then requires complete renewal. Like peat moss, loose open leaf mould should prove a beneficial top-dressing for all Orchids, including *Cattleyas.* Used thus I would wash it off periodically and renew. Personally I shall try a *Dendrobium* in light loose leaf mould as the plants mentioned in these notes were too luxurious to be ignored.

Cymbidiums (see general notes.)—I regret to say that I have, so far, no further information about the nature of the disease mentioned in the last number of this Review, beyond the fact that the Agricultural Biologist is still of the opinion that the trouble is due to a virus of some type. The solution of the problem is, therefore, going to be difficult.

Correspondence I have received shows that this trouble is widespread over Australia. One grower in a district where water was particularly short last Summer conserved his bath and washing water, and used it on his *Cymbidiums.* Certain plants affected with the disease later showed improvement and finally produced vigorous growth. The inference would appear to be that the soapy water, being alkaline, corrected an excess acidity in the compost.

Cypripediums.—The main flowering season is over, and any re-potting necessary should be done right away. More and more growers are now using tan bark. This does not require sifting, and should be placed in the pots loosely and not tightly packed. Also considerably enlarge the drainage hole of the pot. I will again stress the need for copious watering where tan bark is used, in fact, during the summer it is impossible to over-water. This genus generally requires moderately shady conditions, but that can be overdone. Last season one of my three large pots of *Cypripedium insigne* was in a very shady spot. The foliage became deep green, but one flower only was produced, whereas the others had many flowers.

Oncidiums.—In a previous number of the Review I mentioned *Oncidium lanceanum* which had not done too well in the past, but, after being transferred to a piece of tree fern butt, it prospered for a time. I have had to review those remarks. Lately the thermometer has been down to 36 degrees in my house, and that plant lost several leaves and looks very unhappy, so this species had better be omitted by those without heated houses.

Thunias.—These will now require re-potting. Remove all old roots and the previous year's shrivelled bulb and replant in a rich open compost. A stake will be necessary to fasten the bulb to. Water very sparingly until the new growth is about two inches high, then water freely. Liquid manure would be beneficial. Keep it in full sunlight until the flower spikes appear, then place it under shelter. The genus flowers at Christmas time.

Coelogyne cristata.—Far too little of this beautiful Orchid is grown, but possibly the fact that it resents interference by taking several years to settle down to a flowering habit when re-potted, is responsible for its non-appearance at our Shows and Meetings. An effective way to treat the long rhizomed type is to grow it in a large wire basket and train the growths across the top and round the basket. My own plant of this type is right round the basket in some places three deep and every bulb has a flower spike, and many have two spikes. Do not attempt any re-potting unless absolutely necessary, and even then do not disturb the roots in the slightest, but transfer to a larger vessel intact. Even that will upset the flowering habit for a time. Grow it outside in filtered sunlight and water freely. My plants are growing in a mixture of leaf mould, fibre and tan bark. Good drainage is essential.

Phaius.—For the last two years I have been growing *Phaius* out of doors in almost full sunshine just broken by a few scattered pieces of tea-tree. I have three species and a hybrid, *grandifolius Wallichii, Norman* and *maculata.* The last-named met with an accident which wrecked the new growth and consequently it will not flower this year. The other three have flower spikes. *P. Wallichii* has four new growths, and each has a flower spike. The leaves are much shorter, broader and sturdier than those on plants grown under glass. These plants are practically swamp growers and therefore require copious watering. During the hot weather I wrapped old bagging round the pots to keep the roots cool and lessen evaporation. The new growth was excellent. Pot in a mixture of good leaf mould, peat moss and old cow manure, and give liquid manure during the growing period and up to the stage where flowers are about to open. Re-pot if necessary after flowering.

Zygopetalum.—Particularly *Z. Mackayi,* is another Orchid which is well worth while and does best among the *Cymbidiums.* A *Cymbidium* compost will suit, but it is a vigorous rooter and therefore requires a large pot, provided, of course, the plant is established when obtained. Newly imported plants should be put in small vessels until well rooted. On one point care is required. If new growth has started before the plant has come into your possession keep water, as far as possible, from the centre of new growths, otherwise they might rot unless established outside. Once established there is no danger of that occurring. Bulbs take two years to mature. Flowers are produced on new growths a few weeks after commencement.

As the years go on the seasons repeat themselves, and so some of the matter appearing in these notes will necessarily be a repetition of that included in corresponding issues of previous years. However, apart from being of possible use to new subscribers the notes may serve as reminders to others.

● The dry winter around Sydney this year has been favourable to the increase of red spider, thrips, and other pests. Systematic spraying during September will lessen their chances of becoming established. Refer to an article on "Some Orchid Pests" appearing in Vol. 5, Nos. 2 and 3.

● The exhibits at the meeting of the Orchid Society fo N.S.W., April 24, 1941, included many nice items, *Cypripedium Lady Dillon x Cyril Lee* (W. Fahey), *Brasso-Cattleya x Westminster* (C. C. Hildebrandt), and *Vanda coerulea* (A. B. Porter) being conspicuous.

● ***Dendrobium Mortii:*** This pretty native "Pencil Orchid" differs from all its near relatives in its flowering habits. In the first place, it never blooms in the spring as they do; the buds usually appear in January. They develop more rapidly than those of other species, and there is generally a display of bloom in February. The flowers are mostly in pairs; a very pale, almost creamy green, with a crisped white apex to the labellum. They last a bare fortnight, but they have scarcely disappeared before a second crop of buds show up, maturing in March. As a general rule, this is again followed by a third crop, developing a little more quickly. In my bush-house is a good, healthy plant obtained at Brunswick Heads in 1936. It hangs on a thick junk of wood. This year it has beaten all its records. In February it produced 50 flowers, and a second crop, in March, of 45. This was followed by a third of 24. At the time of writing (mid-April), to my surprise it is developing a *fourth* crop, about a dozen buds being well on the way. By its side, on another piece of wood, hangs a plant of the North Queensland form, which came from Proserpine, about 1933. This does not flower before April. It has now just finished its first crop, and already the second is appearing. It usually only has two. The leaves are shorter, more erect, and more rigid than in the southern form, but the flowers are precisely identical in all essentials. Bentham (Fl. Austr, vi, p. 286) named this northern form *D. Bowmanii;* but working from Mueller's herbarium material only, he made a serious mistake in suppressing the latter's *D. Beckleri.* The plant, which he describes as *D. Mortii,* is unquestionably *D. Beckleri,* a spring-flowering species with which most of us are familiar; and his *D. Bowmanii* is none other than *D. Mortii.* Working from dried material only, it would be easy for anyone to confuse these plants if he has never seen living specimens, though they are really very distinct, indeed. The matter is discussed in "The Queensland Naturalist" (Brisbane), Vol. IX, No. 3, pp. 51, 52.—H. M. R. RUPP, 15/4/41.

● At the meeting of the Orchid Society of N.S.W., May 29, 1941, a fine collection of *Cypripediums* was on show. *Cypripedium x Speen,* shown by Mr. A. Royce, of Aqua Flora Park, being about the best of a very good lot. Other exhibitors were Messrs. C. Cambourn, W. Fahey, T. H. James, T. Nelson, E. W. Usher, W. Worth.

Growing Dendrobium Phalaenopsis on a Blade Bone

J. McG. WILLS, *Southport, Q.*

● Just a year ago I became interested in growing Orchids, and included in by first purchase were some plants of *D. Phalaenopsis*. All the plants were in bloom, and must have been recently removed from the trees on which they had been growing, because small pieces of bark were attached to some of the roots, the remainder being badly damaged. I am surprised that they lived, because no new roots appeared until the spring. Now, however, they have made substantial growth in addition to a profusion and quality of bloom more than equal to that of last year.

Knowing practically nothing about the method of potting Orchids, I appealed to some of my Orchid-growing friends for guidance and help. It was suggested that, instead of putting all the *D. Phalaenopsis* in wooden baskets, some should be mounted on blade bones; the suggestion was adopted, and subsequent results have been so satisfactory, that the plants originally put into baskets have now been removed and mounted on bones, and they, too, are now growing strongly.

The bone used should be well weathered; it is then in a semi-porous condition, with a scaly, roughened surface, to which the roots readily become attached. It will also be noted that a bone in this condition has a fairly high capillarity and moisture-holding capacity, thereby acting as a small reservoir on which the plants can draw, if necessary. At the same time, a maximum of air circulation is maintained in the vicinity of the roots, inducing vigorous development.

The mounting is easy. A hole should be drilled at the top centre of the blade bone, and through this a copper wire loop is fastened so that the finished article can be hung up in the desired position. Wrap a little fibre round the bottom, or socket end of the blade bone, securely binding it in position with fine copper wire, space the required number of plants around the peat fibre foundation, and a further fine layer of fibre is then laid over the roots, care being taken not to cover the bottoms of the pseudo-bulbs, and the whole firmly bound in place.

The number of plants used is optional, but the writer has found that from 15 to 20 bulbs make up into a satisfactory specimen, and still leaves sufficient room for the development of new growths. If the pseudo-bulbs are long, there is a possibility of them over-balancing and pulling away from the mounting. This can be overcome by tying back some of the pseudo-bulbs to the wire loop until they have made sufficient growth to support themselves in position on the bone.

Plants mounted as suggested in the foregoing are conveniently watered by immersing the bottom portion in a container having the desired depth of water. My plants are grown in a bush-house facing east, and well protected from cold southerly and westerly winds, ample sunlight is admitted from sunrise until late afternoon. Rain water has been used for watering at all times, with the addition of a little liquid manure once a month during the growing season, but during the winter they are kept fairly dry.

Trichopilia suavis: "I have watched a plant in Judge Markell's collection over a course of years, which has continued to grow well. Actually, there has been nothing particularly difficult in the cultivation of this species. It arrived in a shipment of Orchids from South America, and was placed in a shallow basket with the usual compost of osmunda and local fibre. The plant was grown in a reasonably dry part of the glass-house under the usual conditions, and has always made an excellent show. It seems to do far better when planted in a shallow basket, allowing a reasonable chance for the flowers to be produced over the edge of the basket. The flowers do not stand very high, and appear below the foliage; and basket culture makes the plant look at its best. Considering the ease in growing the plant, and the large conspicuous flowers which have good lasting quality, the attractive nature of the foliage and general vegetative growth, the species is one that should become very popular. Actually all the species of *Trichopilia* which have been seen in this country are showy-looking plants, and make decidedly foremost plants in any collection."—G. HERMON SLADE, 26/5/1941.

Dendrobium Phalaenopsis, growing on a blade-bone
Grown by J. McGregor Wills. Photo. by G. Hart.

● *Prasophyllum,* two new species. In the Victorian Naturalist, Vol. 58, No. 2, June, 1941, the Rev. H. M. R. Rupp describes *Prasophyllum trifidum,* from Middle Harbour, Port Jackson, and *P. aureoviride,* also from localities near Sydney.

Manure for Orchids: In the preparation of organic liquid manure, certain raw excreta are placed in a receptacle with water to break down, in other words, to ferment. Fermentation generally is a very complicated process carried out by the agency of bacteria. Bacteria are useful or harmful, according as to how we assess their work in connection with our interests. Until scientific methods were applied, many a vat of sweet wine was turned sour through acetic bacteria ousting the alcoholic bacteria. Now, practically the same thing happens in the preparation of liquid manure and, unless one is experienced in judging when it is "ripe" or mature, he is plainly courting disaster if he applies it to Orchids.

When liquid manure becomes ripe, that is, when the turbidity subsides, it shows a clearness resembling tea without milk in it, and usually indicates that the battle of the bacteria has resulted in favour of the beneficial kind. The effects of immature organic liquid manure on Orchids do not seem to have been closely investigated scientifically. The mature liquid manure cannot be applied at any time. The definite periods of activity and rest which enter into the life of most Orchids must be taken into consideration. The time to apply liquid manure is during active root growth which, for New South Wales, would be from late November to the middle of March.

Immature liquid manure applied at the wrong time may be the cause of the *Cymbidium* disease now making its appearance. Specimens examined do not show any trace of the ordinary rust or smut spores, and on present indications the disease appears to be the result of ultra-microscopic filter-passing bacteria. The multiplication and entry of these bacteria are made favourable by including too much solid fresh animal manure in the compost, in addition to immature liquid manure.

A very dilute solution of inorganic or artificial manure is safe, but strong solutions lead to congestion in the growing points of the roots of Orchids, which very often turn brown at the tips, and consequently cease to function.—P. A. GILBERT.

● Editorial matter, MSS., and photographs for publication should be sent direct to the Hon. Editor. The address is printed on the back cover.

● Membership subscriptions to the Orchid Society of New South Wales for 1941-42 are now due. Please post your remittance in the next mail to the Hon. Treasurer, Mr. G. J. C. Tosi, 39 Martin Place, Sydney.

The Light Side of Growing Orchids

● When asked by a friend why I took this hobby up I was at a loss for words. He remarked: "I thought you, with your hard looks, would look for something other than growing beautiful flowers." That really decided me, and since joining the Q.O. Society I have discovered quite a few that are not oil paintings, but who grow, what I consider, the most beautiful flower.

For years my wife and I have hung up a few of what we always call Cooktown Orchids. No attention; just left them to what I hear experts say: "Grow them like they grow in their native haunts." We followed this advice by watering them only when it rained. I often smile when I think of the remarks passed by those that were lucky enough to see them in flower; they really thought we knew something about the culture. Being hen-pecked, I thought, seeing the wife has always been a lover of flowers, we would do a little sticky-beaking at the other fellow's collection. In a beautiful glass-house, with four different *Cattleyas* in flower, a strong odour (not perfume) was noted.

We listened to what the other fellow had to say, and when he remarked, after watering, "I dip my *Cattleyas* in this container," we discovered what the smell (pardon) was! I forgot to mention that this sticky-beaking occurred before we decided on a glass-house. After this experience my wife suggested extending the bush-house, and leaving Orchids to those with nostrils that can "take it."

We inspected quite a few collections, and the mixture was explained to my better half's relief. Having got "the bug," we decided that a glass-house must be built.

I'm sorry to say I was told off by the contractor as being the most impatient member of the Orchid Society—wanting to hang plants before the roof was on.

Now for how I came by my 300 plants. Everybody advised, go slow, don't buy, just exchange. I had about 50 "Cookies" (still have them). Nobody would exchange. I soon found out that there were no mugs handling class Orchids.

Friends assisted and others abused me for buying this and that. After a few lessons I learnt what is meant in the Orchid world by getting "the BUG."

I bought Orchids that contained more *bugs* than I thought existed.

Was fortunate in purchasing a collection from Mr. Skerman, of Maleny, 60 miles from Brisbane. As previously mentioned, I was picked on by a few friendly (?) members for buying such a quantity. I like this picking, it reminds me of home. It was at his home I learnt what is meant by Orchid cemetery. He presented me with it, it being about 50/100 empty baskets and pots. Being a mug I looked in the compost (still in the containers) for the cause of death, but found only friendly lizards. Have since learnt that all experienced growers have cemeteries, and some of the reasons why Orchids pass out. The job of collecting those Orchids was not an easy one. Mr. W. Parton, a member of the Society, volunteered to assist me if I could get a truck. We set off one Saturday afternoon about 2 o'clock, arriving at 4 p.m., and after removing the Orchids (200) from their houses to where we had to load them we realized it meant two trips. It was so cold that I had to absent myself to go and have a rum or two. I forgot to mention, when leaving home the wife packed a hamper, including a flask of tea, which immediately capsized and broke. Back home about 8.30 p.m. with our first load, and when I broke the news that we had to return I was politely told we should go to Goodna (Mental Asylum), not Maleny.

After being abused, the wife cooled off and packed another hamper. When half way up the mountain, my friend suggested a cup of tea. I stopped the car in time to see Bill "Part-on" company with the second flask; he knocked the darn thing on to the bitumen road, with the result another row when I got home, and Bill got off Scot free, his wife being trusting, did not hear him come in.

Our friend, Mr. Skerman, provided refreshments, and we arrived home at 2.30 a.m. on Sunday. The old truck was pushed along at about 40, and although we were unlucky with the flasks, our luck was in, as in the morning I found a nail in one of the tyres, which was flat.

The glass-house being completed, I began to hang orchids in their wrong places; in fact, I've had so much friendly advice as to where to hang the plants that some of them have got back to their original places, as selected by the *MUG.*

I learnt at a lecture given by Mr. Smolinski that it assists a plant to cut the flowers. This knowledge is evidently known to a few of my hum (I nearly said Hun) friends. One day, when sprinkling a few plants (*Dendrobium Phalaenopsis*) in flower, plants had not tasted water for two to three weeks, I was soundly criticized. Have since asked different growers what they do, and most say: "A little drink won't do any harm," as they get water when flowering in their natural haunts. This watering business has got me. One expert says: "I water most of my plants two to three times a week in summer, and once a week right through the winter, and watering means a good soaking." Another says "In summer I spray two to three times a day (every) and twice a week in winter," and a third says: "I dip once a week in summer and fortnightly in winter," so now I know what they mean when they say: "You'll learn." As for potting; well, I have tried most ways, but until spring arrives I'll not attempt to give advice.

Would appreciate how to prevent a backache after potting fifty plants.

Can anybody give me a cure for "sticky-beaks?"

Our glass-house, thanks to the contractor, is so handy to the street that over the week-ends we often have several "sticky-beaks," unknown to us, asking to have a look through. It's O.K. when a "MUG" gets away with what the other "Mug" thinks is knowledge, but what happened on Labour Day takes the "Bun." Two women invited themselves in, left the gate open, and in waltzed two hefty dogs. My wife, who was gardening at the time, had just unearthed a ripe bone that had been hidden by our pup about two weeks earlier. The "mongs" immediately came to holds over the bone and, although we sprayed them with the hose, they refused to let go. The scrap lasted five minutes, but it did some good, as by the time we had separated them the "stickies" had disappeared.

We have christened the glass-house "HELLS-DEN." "HELLS, because sometimes in summer (in there) I imagine I have passed out, and "DEN," because it would be a good place to dodge my creditors. The contractor appears (?) to be a good-natured fellow, and has agreed to take a few of my good (I'm taking the seller's word for this) *Cattleya* back cuts when they flower, as part payment.

Can anybody tell me why they call an Orchid cross, like *B.L. Cattleya*, a hybrid; a dog cross a mongrel, and a human cross what they call me at work?

I hope the members have not been bored by reading of my experience, but if I was a "MUG" before taking up the culture of Orchids, I must now sign off as a BIGGER MUG!

● Nature has evolved systems of rest for nearly all forms of life. These may be diurnal or nocturnal. The great majority of Orchids are included in these systems, some requiring but a short rest, while others are dormant for the greater part of the year. There is some analogy between the development of an Orchid flower and the metamorphosis of a butterfly, a comparison being rather interesting. First we have the seed or dormant eye—and the egg; the mature pseudobulb—and the caterpillar; the resting stage which slowly develops the flower bud—and the chrysalis; then the flower—and the butterfly.—P.A.G.

● ***"Crushed Bones":*** A reader is curious as to my method of procedure adopted to produce the "crushed bones" mentioned in my "meanderings"; also the geological period to which they belong, which is "post-prandial."

Here is the answer. Keeping a number of dogs, I buy many sheeps' heads, and these, after boiling, are given to the canines.

The bones are then mostly buried, according to canine ritual, and are collected when digging the garden beds, and deposited in an old tank to dry. When required, an anvil made from a bit of tram rail is brought into requisition, the bone laid on it, and the hammer brought down smartly—and if you miss your fingers you smash the bone.

Simple! Yes, but painful. My left thumbnail has just outgrown the last "blitz."—"H.W."

● The June meeting of the Orchid Society of N.S.W. included an attractive exhibit of Orchids and three colour films. Mr. H. Mallard, well known in the sphere of photography, operated the cinematograph, and explained the pictures in a chatty talk which was listened to with enthusiasm by a full attendance. The pictures were: "A Winter Cruise in Summer Seas," by Mr. H. Mallard; "Bondi Surf Carnival," by Mr. E. Berney, both gentlemen being on the technical staff of Messrs. Harringtons Ltd., and "*Cattleyas* at the home of Mr. E. F. Wilks, Patonga," by another technician on the staff of Messrs. Harringtons Ltd.

Sex in Orchids

Dr. D. A. HERBERT, D.Sc., *Brisbane, Q.*

● The flowers of Orchids are built on much the same basic plan as those of lilies, but they have become modified so profoundly, and in such diverse ways, that the fundamental resemblance is no longer obvious. The same essentials are there. Both types of flowers are essentially sex organs, the male and female organs in the centre being surrounded by the showy sepals and petals. In the lily the femals organ, the pistil, is in the centre of the flower. It consists of a swollen base divided internally into three chambers in which the seeds develop. This swollen part, the ovary, is surmounted by a short column with a sticky top, the stigma, on which pollen lodges. The pollen is powdery, consisting of very minute grains produced in the male organs, the stamens; in the lily six stamens surround the pistil. The stamens and the pistil are the essential reproductive organs, but surrounding them are the showy parts, the petals and sepals, three of each in two rows. In many plants the sepals are green and small. Both petals and sepals are sterile, but are important in protecting the sex organs, and in attracting insects or other animals, including birds, which transfer the pollen from the stamens to the stigma. There it germinates, grows down to the ovary, and fuses with the ovules to produce seeds.

Orchids are adapted in a most amazing way to fertilization by insects, and by peculiar groupings of the various parts of the flower, the provision of landing grounds, intricate paths inside the flower which the visitor must follow, and sometimes by quick movements of such parts as the lip, many of them have become so specialized that only one or a few insects can manage the job of collecting and transferring the pollen. The busy little bee, or any other insect for that matter, does not devote its life to transferring pollen for nothing. It must have some tangible reward, and the provision of food by the plant is necessary. The raised coloured lumps in the flowers—the calli—are often gnawed, or sugar is obtained from nectaries, or it may even be that the plant stoops to deception. By possessing an attractive scent it attracts the necessary pollen carriers. It is a remarkable fact that the scent of many flowers is similar to the scent of one or other of the sexes of the visiting insects. An article on this subject, "Fragrant Butterflies," by A. H. Clark, appears in the Annual Report of the Smithsonian Institute, pages 421-426, 1926.

The insect visitor is so important to the fertilization of Orchids that imported species often fail to set seed because the pollinating agents have not been imported at the same time. *Vanilla* is a case in point; where the insects are not available artificial transference must be effected. The insects simply carry pollen from one flower to the other, and do not alter it in any way, so that artificial transference is just as effective, though perhaps more trouble to the Orchid grower.

Now for the structure of the Orchid flower. It is to be recognised first, that it is greatly modified in its architecture, and adapted to the visits of special insects, and that other insects in many cases, cannot possibly do the work. The parts, however, are essentially the same as in the other flowers. As in the lily, there are three sepals on the outside. They can most easily be recognised by looking at the flower from the back. One stands straight up (for example, the standard in *Cypripedium*) and two others slope downwards. Inside those are the three petals. The lower one is the labellum—the pouch in *Cypripedium*, the crucifix in *Epidendrum* or the beautiful lip in *Cattleya*. The other two are generally small and more like the sepals; they point upwards. It is the labellum which gives the greatest diversity in the Orchid family. Now it is a peculiarity of most Orchids that the flowers are upside down. The labellum should be on top, and the back sepal (the dorsal sepal or standard) should be pointing downwards. The twisting of the part just beneath the sepals can often be seen very plainly, but sometimes the flower stalk grows round in a semi-circle as in *Gongora*, and puts the labellum on top.

It is the central part—the essential sex organs—that is peculiar. Instead of having the pistil in the centre and a ring of stamens around it, the Orchid has both combined into a column which curves slightly forwards. It is on the top of this column that we find both stamens and stigma. Instead of the six stamens of the lilies, there are two only in the *Cypripedium* tribe, and one only in other Orchids. The pollen is not a powdery dust except in occasional Orchids, such as *Vanilla*. It is held together in waxy masses and transferred *en masse* to the stigmas of other flowers by the insects. But the waxy masses, though not powdery are, nevertheless, composed of an enormous number of pollen grains, and when they finally arrive on a stigma they germinate, and each seed formed is the result of fertilization of an ovule by one pollen grain. The enormous numbers of seeds in a fertile capsule indicate the enormous number of pollen grains that may be carried by a single insect in one visit to the flower.

The pollen masses are quite easily detached by the appropriate insect, whose main problem is entrance to the flower. The pollen load is dumped on him, her, or it, without permission. That is the Orchid's own business. The visitor is after something else. Artificial pollination is simple. Where an insect has to find an often somewhat tortuous path, the Orchid grower can open up the flower forcibly, and remove the pollen with a brush or a pencil point. All that has to be done is to remove the part which is obviously detachable from the top of the column, and transfer it to the flat sunken patch which is the stigma, on the column of another flower.

There are certain Orchids in which suppression of one or other of the sexes occurs normally in certain flowers. *Catasetum,* for example, is a South American Orchid which has the sexes in different flowers, and those flowers may appear on different plants. In the early days this led to great confusion, because the flowers were so different that they were thought to belong to different genera. The male flower was first described as *Catasetum,* the female as *Monachanthus.* A third genus, *Myanthus,* somewhat similar to *Catasetum,* was also named. Finally, because these three genera occasionally appeared in the same plant, or even on the same spray, it was found that there was a variation in sexuality—that some flowers were variable males, other females. A related genus, *Cycnoches,* from tropical America, gave similar trouble. A collector in Guatemala collected what was apparently a new *Cycnoches,* with long pendulous sprays, like those of *Gongora,* and sent them to England. They flowered, but proved to be no novelty. They were the old *Cycnoches ventricosum.* Three times the collector sent supplies across to his annoyed clients, and three times they flowered as *C. ventricosum.* Then, in 1842, a plant in Gloucestershire produced flowers of both types, *C. ventricosum* and *C. Egertonianum,* the female and the male respectively. Actually, there are about sixteen species of *Cycnoches* known, and there was a lot of confusion in the naming of the species because of this sexual variation, a confusion that was not cleared up until 1909, when Rolfe revised the genus.

A much less confusing behaviour is shown by some of the *Oncidiums* of the section *Integrilabia. O. ornithocephalum,* for example, often produces in a normal flower spray groups of minute sterile flowers with narrow petals and sepals. *Renanthera Lowii* often produces two kinds of flowers in the same spray, one yellow with brown flecks, and the other mostly brown and differently shaped. Here, however, there seems to be no noticeable difference in the power to produce seeds.

Notes on Cattleya Culture and Potting

● All new pots should be soaked in clean water and dried before using, and old pots must be cleaned before being used for potting plants. When using five or six inch pots, place a piece of crock over the hole, and put all the crocks on edge, then lumps of charcoal up to two inches in the pots, with osmunda on the top and polypodium to sit the plant on. After having done this, pack the plant tightly and tie to a stick in the centre of the pot or basket (which I prefer). Tie down with copper wire so that the plant will not move. Then water with clean water, and let it dry for two weeks before watering again, or keep the compost slightly damp. *Cattleyas* like sunlight, but not too bright. They do not like the full rays of the sun. I prefer all *Cattleyas* in wooden baskets hung from the roof about twelve or eighteen inches from the glass. The December, 1940, issue of the Australian Orchid Review gives several lectures on growing all kinds of Orchids. The March issue also has several instructive articles, and the American Orchid Bulletin is full of wonderful information well worth reading. I use the hose on my plants when the sun is very hot overhead, but not on the plants which are in flower. I use every care with my plants and flowers.—J. SMOLINSKI.

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Memories of an Orchid Lover

Rev. H. M. R. RUPP, *Northbridge, N.S.W.*

Continued from Vol. 6 No. 2

. My travelling area there was about 7,000 square miles, extending out to the western plains and as far as Boggabilla on the Queensland border near Goondiwindi. And there were no motor cars in those days! Most of my trips were done by "sulky" or on horseback. I preferred the latter. The black soil country, of which I had plenty, is negotiable in wet weather on horseback; but to be caught by rain when driving simply meant leaving the vehicle "to be called for next time." My parish included a variety of soils. Besides the black stuff, which extends well into the hills from the plains, there was plenty of rich loam, and also a great deal of pure sand. The sandstone hills round Warialda are not unlike those about Sydney. A few miles up Warialda Creek from the town was a granite outcrop, known from one of the curiously-balanced "tors" as "Cranky Rock."

In a good season, the Warialda district has few rivals in the matter of the wealth and beauty of its native flora. So keen is my recollection of the many lovely wild-flowers that I am strongly tempted to forsake Orchids for the moment and "let myself go" about other things. But I must refrain. Orchids were not very numerous. There was plenty of *Cymbidium canaliculatum*, and towards the plains it assumed the beautiful golden-flowered form which is so common in the Pilliga Scrub. I must admit, however, that I never saw it actually on the plains; which is rather curious, since it is so abundant on the flat country still further west. All the other Orchids were terrestrials; two or three *Diuris*, two *Calochilus*, five "Greenhoods," the larger *Glossodia* and a few others. One of the *Diuris* has recently been described and named by the writer ("Vict. Nat." July 1940) as *D. Colemanae*, after Mrs. Edith Coleman, who sent specimens from Ganmain in Southern Riverina. I had never been satisfied with the determination of this plant given to me when I was at Warialda (*D. Sheaffiana*). An examination of numerous specimens from various inland localities at the Sydney National Herbarium, together with Mrs. Coleman's Ganmain material, convinced me that it was really an undescribed species. It flowers in October.

From Warialda I went for two years to Yea in Victoria, for reasons connected with my father's health. I did no botanizing in that district; I do not quite know why. After that I accepted work in New South Wales again, and this time our home was to be at Copmanhurst on the Clarence River. The North Coast was then entirely a new world to me. My wife and I were deeply impressed with the magnitude of the Clarence, which indeed is in many respects the most imposing river of the State. It has a very extensive watershed, the main stream rising in Queensland, while the chief tributaries drain a considerable area of New England and the coast range between that plateau and the ocean. The river is nearly three miles wide at its mouth, and at Grafton, 50 miles up, it is not far short of a mile. Copmanhurst is 30 miles further up, at the head of navigable waters. The scenery of this district, especially wherever one is in touch with the river or its tributaries, is superb. The Copmanhurst hills are really the far eastern foothills of the New England Ranges, which rise tier after tier westward until the tableland is reached. Through the nearer ranges the Clarence and its affluents have carved mighty valleys and narrow gorges. The vegetation in the valleys is sub-tropical in character; dense rain-forests, palm scrubs, and deep fern-clad ravines. Of course, I am speaking of the area as it was when I knew it thirty years ago; much of it is doubtless now changed by the ruthless but necessary progress of settlement.

The forests and palm-scrubs were rich in Orchids. In those days I knew next to nothing about our epiphytes; but it was not difficult to identify most of those which I found from Fitzgerald's descriptions in "Moore and Betche," and when I was in doubt the late J. H. Maiden and his staff often solved my problems. I have often wished, however, that the knowledge of Australian Orchids which I have gained since had come to me before my sojourn on the Upper Clarence; for I am sure I missed a lot through my ignorance.

I have very vivid recollections of my first acquaintance with *Dendrobium Kingianum*. At the back of the village of Copmanhurst was a rocky hill known as Mount Mulligan. Thither I wandered at the first opportunity, to find the small cliffs literally covered in many places with the tall-growing form of this lovely little Orchid.

A few miles up the main valley a track led through a gap in the sandstone hills into a great palm-scrub, where *Dendrobes* and several species of *Sarcochilus* were abundant. It was near this scrub that I once saw the most magnificent display of *Dendrobium speciosum* of my experience. An enormous mass of rock, measuring about 40 feet by 20 feet and perhaps 10 feet high, had broken free from the cliffs and fallen on to the scarp below. I do not exaggerate when I say that its upper surface was invisible because it was completely hidden under scores of great "Rock-lilies" in full bloom. There were more on the sides, interspersed with giant staghorn ferns. From the foot of the cliff just above, I could look down on what seemed a solid mass of the Orchid blooms, framed in the ferns. It must have been, I imagine, at least a century since that rock-mass had fallen, for the Rock-lily is not a rapid grower, and these all appeared to be veteran plants.

I see by my list (I kept a "census" of the native plants wherever I went) that I found 47 Orchids in the Copmanhurst area, of which 23 were epiphytes. I have no doubt that these numbers would have been much greater had I known more about the subject. But it must be remembered also that many years were yet to pass before I concentrated my attention upon Orchids. I loved all the native plants (as, of course, I still do), and I studied them and collected assiduously both for the National Herbarium and my own, along the Upper Clarence. It is somewhat surprising that in all my rambles there I never once came across either *Sarcochilus falcatus* or *S. Fitzgeraldii.* Both must surely be there. But I met for the first time there, growing on Hoop pines, the fascinating "Raspy-root," *S. divitiflorus.* Had I investigated those pines a little more closely, who knows but that I might have forestalled our friend Mr. Weinthal by twenty years in the discovery of the remarkable little *Bulbophyllum* which now bears his name?

My next move was across to the western side of the New England plateau. I was appointed to the charge of Barraba, which lies in a valley 1700 feet above sea level, just where the Nandewar Range breaks off westward from the main New England Range. This branch range is, or was, known locally in the plural, as "the Nandewars." I came to know and love the Nandewars very well. They run west from the main range for about 20 miles, as far as the valley of the Upper Horton (an affluent of the Gwydir), and thereafter they form a somewhat broken mass running north and south. It is in this area that they attain their greatest height, Mount Kaputar just topping the 5,000 feet level. In my time Kaputar was known as Mount Lindsay, but nowadays this name is relegated to a lower peak. Perhaps it is as well, for it avoids confusion with the better-known Lindsay on the Queensland border. In the Horton Valley, on the eastern slopes of Kaputar, there is a glorious waterfall of 370 feet sheer drop. It was very difficult of access when I lived at Barraba, as it lies in some of the wildest and most rugged country I have ever traversed.

My parish was about 48 miles long from east to west, with the town of Barraba about the middle. I had very little travelling north or south. On the east the hills rose steeply, ridge after ridge, towards the New England plateau. About 8 miles out there was an interesting tract of serpentine country, the vegetation of which differed considerably from that of the adjacent areas. It was here that I found a "new" *Boronia,* which was subsequently named after me by Mr. Edwin Cheel. Here also, for the first time, I found the yellow-flowering "Hyacinth Orchid," *Dipodium Hamiltonianum.* Above the serpentine there was an extensive area of very rough mountainous granite country, where grew in profusion many of our loveliest Wattles. On the granite rocks *Dendrobium linguiforme* was quite common; this is the only locality where I personally have seen a *Dendrobium* on the western side of the Dividing Range. Most of the Orchids were terrestrials; though *Cymbidium canaliculatum* was abundant on eucalypts throughout the whole district; and I find that I recorded *C. suave,* though I cannot remember where it grew. To the west of Barraba was a grassy valley beneath the southern scarp of the Nandewars, and a road led along this valley and over a gap into the Horton Valley on the other side, the Nandewars here dividing the waters which feed the Namoi from those which run north to the Gwydir. The wild country between here and Mount Kaputar was very fascinating to a botanist. Ground Orchids were plentiful, chiefly *Diuris, Thelymitra,* and *Pterostylis,* with a few *Caladenias* and the ubiquitous *Glossodia major.* From the summit of Kaputar there is a magnificent panorama of the great Western Plains, on to which the western scarp of Kaputar drops steeply for nearly 4,000 feet. It is remarkable that just a few hundred feet from the summit on the eastern side, one feels a hundred miles from such country as the plains; for there, at the very source of the Horton River, is a beautiful grove of the tree-fern *Alsophila australis.*

Epipogum Roseum

● ***Epipogum Roseum*** (*D.Don*) *Lindl*: By the International Rules of Nomenclature, the Orchid known in Australia by Reichenach's name *Epipogum nutans,* must revert to an earrlier specific name, viz., *E. roseum.* The history of this name is as follows:—

Limodorum roseum D.Don. in Prodr. Fl. Nepal., Feb. 1825, p. 30.

Galera nutans Blume in Bijdr., July, 1825, p. 416.

Epipogum nutans Reichb. f. in Bonpl. V., Feb., 1857, p. 36.

Epipogum roseum (D.Don) Lindl. in Journ. Linn. Soc. i (1857), p. 177.

Thus Lindley, as long ago as 1857, restored the first-published specific name to this Orchid, which had originally been placed in the genus *Limodorum,* then removed to *Galera,* and finally to *Epipogum.* Why Lindley's correction of the specific name was for so long overlooked, it is not very easy to conjecture. See Oakes Ames, Orch. 2 (1908), p. 48.

Epipogum roseum is an interesting terrestrial, perhaps wholly saprophytic, which occurs sparingly on the North Coast of New South Wales, extending thence northward throughout the coastal regions of tropical Australia, to New Guinea, the Malay Archipelago, and tropical Asia. It is also found in Africa. It is a succulent, leafless plant, with a terminal raceme of whitish or pale pink flowers, which turn a deeper pink when dried. Blume named it *nutans* ("nodding") from the supposed nodding habit of the raceme; but this is now said to be by no means a constant characteristic, or at all events, to occur only at a certain stage of the flowering. (Cf. *Geodorum pictum,* in which the raceme is erect in the budding stage, bent right over during the flowering, and straightened up again for fruiting.) Fitzgerald (Austr. Orch. ii, pt. 5) represents the raceme as nodding.—M.H.R.R.

DENDROBIUM PHALAENOPSIS, *Fitz. var. Schroederianum*
Grown by Colonel S. T. Jackson. Photograph, J. R. Bailey.

● *Cymbidiums* at Mr. C. Cambourn's Orchidery, Northbridge, N.S.W., are arranged on benches, under tea-tree shading, with an easterly aspect, the site being fully protected from westerly wind. Mr. Cambourn also has hothouse and intermediate accommodation. Many other species thrive under his treatment, notably *Dendrobium Phalaenopsis,* var. *Schroderianum, D. bigibbum, Zygopetalum Mackayi*—a superb variety grown with the *Cymbidiums,* and *Oncidium varicosum.* Mr. Cambourn, in collaboration with Mr. A. B. Porter, is also propagating Orchids from seed, *Cymbidium* and *Epidendrum* plantlets being in evidence. Although a part of the harbour is in view, the houses are several hundred feet above sea level, receiving the full benefit of the moisture-laden north-easterly winds.—P.A.G., 4/5/1941.

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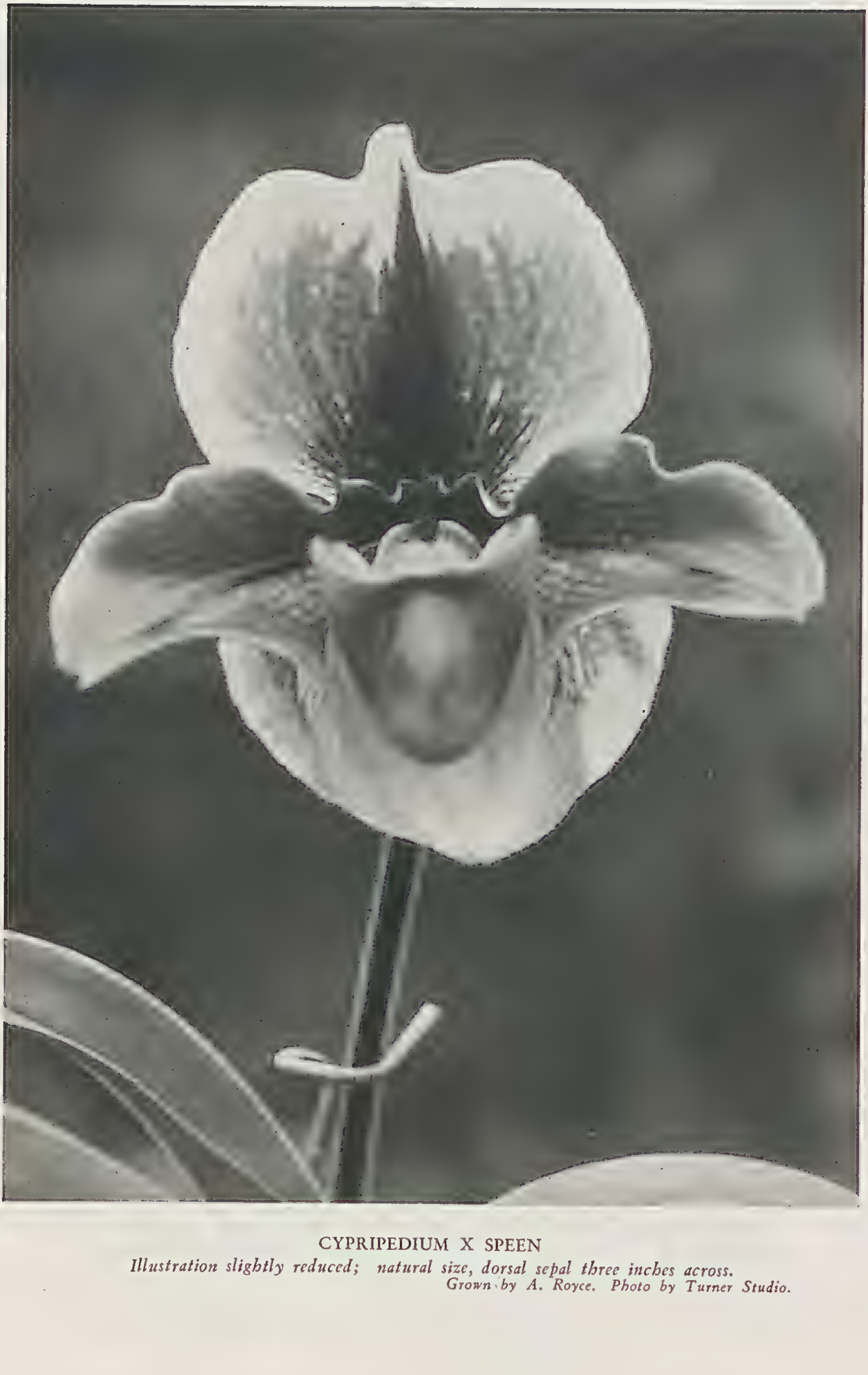


CYPRIPEDIUM X SPEEN

Illustration slightly reduced; natural size, dorsal sepal three inches across.
Grown by A. Royce. Photo by Turner Studio.

Australian Orchid Review

Editorial

Overstocking the Orchid House

● Overstocked accommodation is a condition of Orchid culture which does not become evident until the time arrives to squeeze in an extra plant here and there. Usually a house is constructed as a place of safety for "'a few Orchids," but the irresistable fascination of growing Orchids soon outstrips the modest ambition of growing "a few." The rapidly acquired knowledge of the varieties to grow, creates a desire out of all proportion to the original intention.

Hence, no matter how large the grower constructs his house in the beginning, it invariably becomes too small before the paint has had sufficient time to set properly. Plants are much easier to acquire than accommodation, consequently they "creep in" until a struggle for existence develops somewhat related to that obtaining in the wilds.

The entanglements are various, according to the species and hybrids stocked, as well as the nature of the house, and its location. If it happens to be a bush-house sheltering *Cymbidiums* in a yard with plenty of space containing trees, we usually observe that the least interesting kinds are selected to undergo open air treatment, and thus the better plants are afforded more favourable surroundings.

It is in the hot-house, however, where the evils of overstocking make themselves manifest. Just now the greatest disadvantage is, perhaps, that of inefficient watering. With plants crowded it is impossible to water them all effectively. Where the leaves of a *Cypripedium* plant, for instance, hang over a neighbouring plant, they will either run extra water into their own pot, or deflect the water from the pot intended to be watered, especially if the hose is the means of watering. Thus, side by side, one plant will receive more water than is necessary, while the other takes in very little, if any. Therefore, it is advisable to examine plants closely in crowded houses, periodically dipping those that have not received their proper quantity of water. After all, dipping is the perfect way to water the roots.

As a result of overcrowding, mediocre aeration and light may be mentioned. It seems almost useless to provide for ventilation, and free circulation of air, if the plants are so crowded that they cannot derive any benefit from the air admitted, nor is it much good devoting time to the question of light if the occupants are allowed to smother each other. If the roof admits the correct intensity of light, but the plants on the benches are not spaced to make the best use of the light, they will develop weediness, and lack that capacity to flower liberally.

The most serious fault of crowding is the protection afforded to insect and other pests. It is impossible to examine plants thoroughly when they are jammed one against the other. Batches of thrips and red spider can breed unmolested until they are in sufficient numbers to do real damage among the plants, and once established it is no light task to eradicate them, to say nothing of the loss of plants occasioned.

Having regard for the disadvantage hinted at, it would seem prudent for the beginner to either subdue his desires, and make a complete success of the room available, or provide for the inevitable extension which sooner or later will become due, to keep pace with his growing ambition.

Growing Orchids Artificially and References to Nature's Lessons

W. F. ADAMSON, *Bulimba, Q.*

● Orchids are often referred to as parasites obviously because of their habit of living on other plants. Orchids which are adapted to live on trees are epiphytes and definitely not parasitic. They do not interfere with, or contact the sap, or the life stream of the tree. They have adapted themselves to trees for a number of reasons, the chief being a matter of light and air. The scales, cracks, and channels of the bark provide for the delivery of moisture, and decomposed vegetable matter to the roots of the Orchid. Parasites penetrate, rob, and strangle other plants.

Epiphytes including Orchids do not do these things, rather they live on the natural and seasonal waste of other plants. Orchids have been divided into two sections, epiphytical and terrestrial. The former are those found growing on rocks and trees—*Aerides, Brassovola, Dendrobium, Cattleya, Epidendrum, Renanthera, Saccolabium, Laelia, Phalaenopsis* and *Vanda* are typical examples.

There are a number of *Dendrobes, Epidendrums* and *Cymbidiums* that can adapt themselves to terrestrial conditions. The following are some that I have observed growing under these conditions: *Dendrobium speciosum, D. Kingianum, D. delicatum* and *D. undulatum*. They are always found exposed to almost full sunlight, high up on rock faces, where the drainage is good. They thrive in a compost of fern peat, leaf-mould, decomposed, crumbled, or broken rock. Some of these plants certainly should be regarded as semi-epiphytical.

Cymbidiums are classed as epiphytes, but many of them should be classed as terrestrials. Those that are natives of this country grow mostly on hardwood trees. A very noticeable fact about them is, that they do not expose their roots to the air. Their roots are of such a nature that they would be of little use were they so exposed. The roots of *Cymbids* are soft and fleshy, and establish themselves within the pipes of dead and green trees. The compost is light, loamy and moist, the pipe providing cool shelter and perfect drainage. I have seen hundreds of plants of *Cymbidium irridifolium* growing to perfection in rotten wood and leaf-mould on the ground. The Japanese have a species *C. verens* which grows always in the ground, and is very hardy. Most of the epiphytic group come from places where heavy seasonal rains are frequent, humidity is high, and are subject to dew and fogs at night.

The general structure of many orchids is an object lesson for the amateur grower. The *Vanda* tribe, for instance, all carry very heavy roots and stems, which are capable of storing sufficient food and moisture, to susutain the plant over a fairly dry period. *Cattleyas* and *Dendrobes* are provided with stout pseudo-bulbs for the same purpose. This facility has been provided so that over dry seasonal periods Orchids may draw upon their store of food, usually in preparation for the flowering stage. The roots of most of them are fully exposed to the air in nature, and although at times they receive huge quantities of rain, they are quickly dried by their exposure to the air.

When cultivating Orchids artificially, we should take heed of these lessons of Nature. They are vital and necessary if we are to be successful. If Orchids are cultivated in pots, particular attention should be paid to the drainage. Drainage holes should be enlarged always. Baskets provide Orchids with many natural elements in that excess moisture can get away quickly, and circulation of air is free and liberal.

I have referred to Orchids having powers of sustenance, either through their thick fleshy roots and stems, or heavy pseudo-bulbs. The object being to point to another clear lesson provided by Nature. When we import or receive a number of epiphytical Orchids we should not rush them straight into the compost in which we wish them to grow. They are usually devoid of feeding apparatus (leaves and roots). Naturally compost at this stage is detrimental, and if kept in a moist condition would be fatal to the plant. The plant at this stage is dormant, and in fact is a self-contained unit. It only requires a simple understanding of its needs to enable it to emerge from its dormant state to active life and growth. Suspension in a light, airy, humid atmosphere will induce growth, leaves and root soon follow. When roots begin to appear it is then the proper time to pot. The plant has provided itself with the means of absorbing food, nourishment, and moisture from the compost and atmosphere. As root growth increases a generous ration of water will be required to enable the plant to use the food provided, and to assure rapid and sturdy growth. Sturdy growth from infancy produces flowers and quality during mature and ripe old age.

Terrestrials. — *Arundina, Bletia, Calanthe, Cypripedium, Phaius, Peristeria Selenipedium, Thunia, Habenaria, Spathoglottis, Goodyera, Anoectochilus* and others are members of this group.

They are mostly what I term floor plants. Some are found growing on moss covered rocks, others prefer the rich humus beds of the scrub or jungle, the remainder inhabit fairly open positions on hill and mountain sides. *Phaius* in Australia are found growing close to swamps, while in the tropics, where the rains are heavier and more frequent, they grow along the lower foot of hills, and not near the swamps. Many terrestrials have no pseudo-bulbs so will require water at all times.

Their physical construction suggests that they have very poor powers of sustenance. In other words they live from day to day. Nature provides for all her children so she has placed these plants where they are not battered and dried out by wild winds, and are not withered and disfigured by the action of strong sunlight. The moisture content of their bed below is always ample, even if there should be a drought above. Again we should follow Nature's lesson in cultivating terrestrials of this type.

Spray terrestrials frequently, and you will never be troubled with thrips. *Cypripediums* are, to most of us, the main interest in the terrestrial group. With few exceptions *Cypripediums* are shallow rooted plants. *C. Charlesworthii is* a good example, its roots appreciating a light bed of limestone crocks. For a top compost nothing can surpass good leaf-mould. If we provide an atmosphere that will grow moss and keep it growing in a healthy condition during summer and winter, then the *Cypripediums* will grow and flower to perfection. In order to produce this condition we must provide a bush-house having glass sides or a straight out glass-house.

I believe that the use of leaf-mould as a compost for the *Cypripedium* reproduces its natural element of nourishment. Decomposed vegetable matter contains everything necessary to the health, and well being of the plant. It is a safer and more natural source of food than the use of animal or artificial fertilizers. While on this subject I would like to say that I believe that the use of artificial fertilizer on Orchids is a dangerous practice except at the hands of an expert, with knowledge and experience. Plants nourished in this way in spite of their outward robust appearance become hollow and bloated. Top growth is often produced to the detriment of the roots, and if carried to extremes, the flowers as well. Things that are bloated and fattened artificially can never have the constitution of those that of necessity had to work under natural conditions for their right to live. Their product, if any, is as unnatural as their mode of life. They also have difficulty in reproducing their kind by seed. Experiment and observation have demonstrated to me that Orchids are simple in their needs, and possess the organs necessary to enable them to manufacture all the food required for life, growth and reproduction.

Many of us are apt to look upon an Orchid as just an ornament for men's fancy. This is a first impression. Deeper thought produces the fact that it is a living thing and is just as dependant on certain elements of Nature as man is himself. On our intelligent understanding of this matter depends the health and life of the plant.

Light is a most important factor. I would not like to say that Orchids have feeling, but I can say that they are able to make us understand whether we are proportioning the light to their advantage, or disadvantage. The development of pale green leaves means that the light is poor and deficient. Lots of things can cause this, it may be that we have shaded to extremes, or painted the glass to heavily. Often a shift of position, or lift towards the light is all that is necessary to rectify the matter. The other extreme of too much light produces yellow brown and blistered leaves. This condition causes a physical break-down of the organs in the leaves so necessary to the life and vigour of the plant. We can rectify this mistake by a change of position, lowering the plant or perhaps addition of a little more shade overhead. If the light is not correctly balanced or applied your Orchids will certainly not flourish. Though you may provide food and water in plenty you deny the plant the use of it if the light is poor. These facts should enable us to understand that it is the light, and heat of the sun, which provide the energy and means, for the plant to absorb its food.

It is during the period of light that starch is manufactured in certain of the leaf cells. At night this action ceases, and the starch is dissolved in the cell say and passed along to any point where it is required. That should again demonstrate the fact that Orchids require good light to enable them to provide the base of their food supply.

If the glasshouse is of the gable roof type it should run north and south in order to obtain the best distribution of light. On the other hand if the house is of the lean-to type it should run east and west with the glass facing up to the run. The object of shading should not be to exclude light, but rather to break it in its passage *through the glass and thus prevent sunburn.*

Water in Winter.—There can be no hard and fast rule in regard to this question. Many things have a bearing on it, such as location, type of house, compost used, amount of ventilation, heat provided, and outside weather conditions. In winter it is better to water in the morning and often it pays to water only the walks and benches, and of course terrestrials which will not stand dry conditions. If a heating system is in operation then more water will be required than in an unheated house. We should always try to keep the temperature from fluctuating to any extent.

Water in Summer.—Summer presents very few problems to the grower. Provided the ventilation is correct he need not be afraid to be generous with the water. Water overhead at night, and if convenient spray the walks and benches at intervals throughout the day.

Air.—We should appreciate the fact that the air supply to the house it vital and closely linked to the water question. If the house is just a hot box, badly ventilated and watered to excess, under this condition we will produce a stinking stagnant atmosphere. Guard against this condition, it is foreign and vile treatment. Further it is a producer of filth, vermin, bad health, and finally death if not corrected. Ventilators should be wide open top and bottom, day and night during the summer. If ventilation is adequate, and water is balanced in its relationship, then we will have produced an atmosphere essential to the growth of Orchids.

Atmosphere.—The atmosphere is important because Orchids, like other members of the vegetable kingdom, obtain their food supply by the process of absorption.

The food obtained is partly liquid and partly gaseous. The roots serve a dual purpose, they attach and hold the plant to the host or compost, and take up moisture containing nourishment required by the plant. The pseudo-bulbs or stems of Orchids also serve a dual purpose acting both as a conveyor of nutriment and a storehouse for leaner times for future use, usually the period of rest prior to the flowering stage. The leaves of an Orchid always grow and face up to the light, and heat of the sun. Under the influence of sunlight and heat, certain cells in the leaves have the power to manufacture starch for the support of the plant. During night time this action ceases and the starch which was built up during sunlight is dissolved in the cell sap. It is conveyed in the sap to the parts of the plant where active growth is proceeding. The leaf cells also during sunlight have the power of evaporating into the atmosphere, watery and waste matter in the cell sap.

It will be understood that this process of evaporation from the leaves will promote absorption of liquid containing food through the roots. This is the reason why so much spraying is required on hot dry days. This should also prove to us why winter is the resting or ripening period for a great many Orchids. The light and heat of the sun at this time of the year has a diminished influence on evaporation, consequently the power of absorption is regulated to correspond. There is very little inducement to growth.

In conclusion we should realise that all the ills of Orchids grown in glasshouses, including vermin, physical disabilities, spot, dry, and wet rot, are caused by an improper understanding of the Orchids' requirements. Vermin do not thrive on things that are clean and in robust health, so in order to keep them in check the atmosphere should be clean and sweet, and the light properly balanced. Spot, dry, and wet rot, are all somewhat related to the atmospheric condition of the house. Any of the following items may be the fault—insufficient air coupled with watering overhead at the wrong time, bad drainage, sour water-logged compost, cold and fluctuating temperature. There are sprays and cures for these ills in Orchids but prevention is a better cure. Just a little thought and understanding—that's the remedy. If failure comes your way, don't groan and moan and blame the plant. Failure sometimes proves an asset. It brings our thought, and intelligence into play, and produces understanding. Understanding brings success and pleasure in your hobby.

● Articles and notes on Orchid lore are required for this Review. The simplest observation may be of great value to some other Orchid enthusiast.

Vegetative Propagation

P. A. GILBERT, ***Lakemba, N.S.W.***

● When the beginner has absorbed the information necessary to assist him in building up a collection of Orchid plants, and has attained reasonable success in their cultivation, the time arrives when he has to repot some, or many, of his plants. Repotting time is the most favourable to consider propagation by vegetative means. A considerable increase in plants can be achieved by this method, which is readily handled by the amateur, and generally the derived plants reach the flowering period a season or two in advance of plants raised from seed. There are several ways of multiplying plants by vegetative agencies.

Cypripediums: At the time of repotting, the roots should be thoroughly cleaned of old potting material by washing them in water. Examine the plant closely, and if it shows only one lead with old leaves persisting after flowering two or three years previously, make a division by cutting through between an old growth and the newer ones with a sharp knife. Suppose the plant shows four strong successive growths, including the leading one, the grower can adopt one of three ways in which it can be dealt with, depending on the vitality of the plant: (1) Cut the plant in halves, one half being the leading growth with last year's flowered growth, the other half being the two oldest growths. (2) If the leading growth is not very far advanced, cut away the oldest growth only, leaving the original plant with two back growths, potting the single old growth separately. (3) If the two oldest growths are strong and with full greenness, divide these again into single plants, potting them separately; but, if these oldest growths show signs of yellowness, do not divide them, as the yellowish part will probably die, whereas, if left attached to the greener forward growth, it will likely develop its dormant leaf buds.

Very often a vigorous hybrid or species outgrows the pot by making several leads. These leads can be separated into single plants by cutting them at some point where they branch away, leaving two back growths attached to each leader—three growths in all. After this operation of division, very often a stump remains; pot this as a single plant, which will make several shoots, quickly growing into a flowering plant. The correct time to make these propagative cuts, which is also the best time for repotting, is after the flowering period and before the active growing period, when roots are in action, generally August to April for most species, and hybrids in New South Wales. Unless the grower has a heated glass-house, vegetative propagation should not be carried out during May to July.

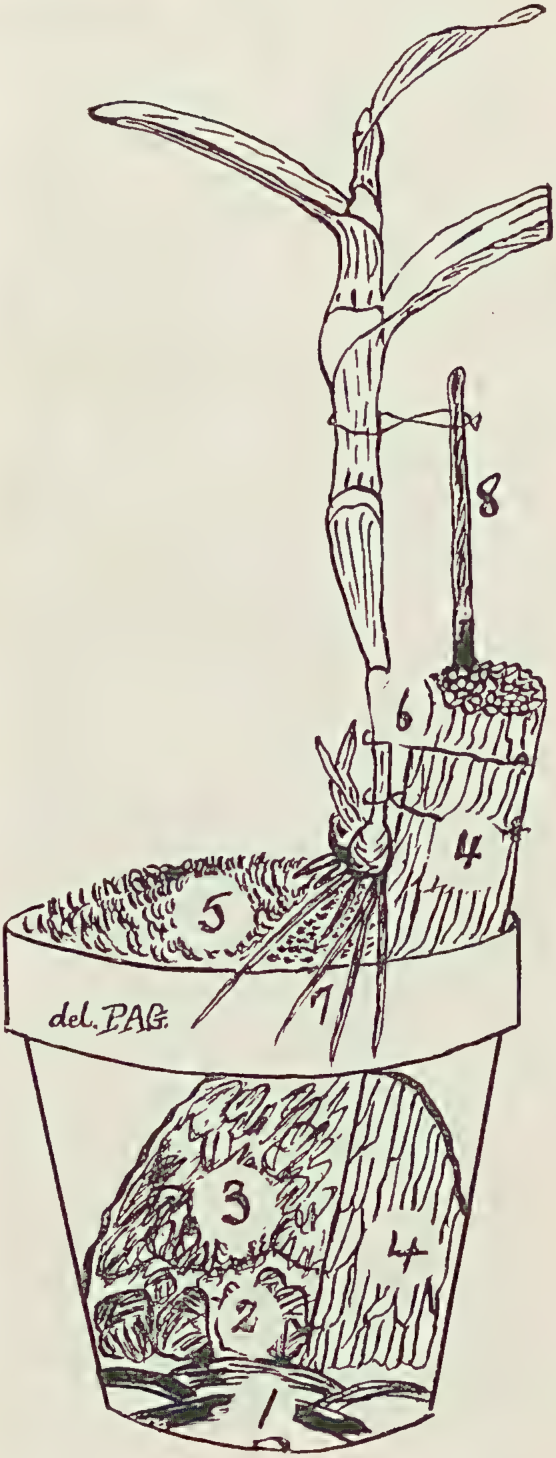
Sometimes, however, a division can be made during active growth, leaving the divided plant undisturbed in its receptacle, this depending on the habits of the hybrid or species to be treated. For instance, during active growth a plant spontaneously develops new shoots from the oldest growth. Back growths do better in a humid atmosphere when repotted, the pot being sparingly watered until root action takes place, and leaf growth begins. It is a safeguard to rub slacked lime into the cut surfaces of each division, this preventing any decay that may attack an exposed cut. The beginner has no occasion to be "nervous" about dividing his plants if he carries out the operations as to "how and when" here briefly described.

Vandaceous plants, such s *Vanda teres,* and the like, are readily multiplied by division. The plants of this group are characterized by their monopodial habits of growth, that is, they continue growing from the same terminal bud. As they grow, aerial roots periodically develop along the stem, generally from the older and lower leaves, or from the scars where the leaves were attached to the stem before dropping off. The vigorous and slender growth of *Vanda teres,* familiar to many, makes it an awkward subject in the house after a while. The plant can be shortened by cutting the leafy stem about two-thirds of its length from the terminal (top) leaf, providing the portion to be severed contains one or more aerial roots. Repot the cut, leaving the "stump" in its receptacle undisturbed. In due course, the "stump" will throw out a new growth, which must be regarded as a newly acquired plant, in so far as providing it with a humid atmosphere, and withholding overhead watering until the new shoot becomes robust. Practically all the species and hybrids of the genera *Aerides, Vanda, Vandopsis, Renanthera, Angraecum,* can be multiplied as above.

Dendrobiums offer more scope for rapid vegetative multiplication than most other species, and are propagated freely by what are variously known as "aerials," "offshoots," or "offsets." These are obtained:—(1) By forcing plants to develop offshoots instead of flowers, this being achieved by providing growing conditions before the flowering eyes become set. High temperature, high humidity, and water at the roots will stimulate the transformation from flower buds to leaf growths. If the green pedicel which carries many *Dendrobium* flowers, is left on the pseudo-bulb when cutting the flowers off, it will frequently develop an offshoot. Dormant eyes remaining on flowered pseudo-bulbs can also be induced to spring into activity, but once an eye has flowered, and the green pedicel has been removed, there is not much hope of getting an offshoot. (2) Old back pseudo-bulbs can be cut away from the rhizome and laid on a tray of fresh sphagnum moss, the dormant eyes responding at the right period. All old pseudo-bulbs can be cut from the rhizome excepting the leading growth, and the two succeeding ones. The operations is best carried out after the flowering period, and before the present season's growth develops roots, this being the opportune time to repot also. If, however, it is not necessary to repot, the rhizome can be severed, leaving the old pseudo-bulbs in the receptacle. These will probably develop dormant eyes at their bases, the new leaf buds growing at the expense of the old stem until they generate their own roots. By this means several leads can be encouraged. Again, if desired, the old pseudo-bulbs can be cut into short pieces of about three inches long, which can be potted either in fibre or laid on sphagnum moss.

(1) Offshoots growing on the parent plant can be detached as soon as roots are about half an inch long, or (2) the offshoots can be left until the following spring. Both periods have their advantages and disadvantages. In regard to the first, their early removal prevents a drain on the parent plant, but they are slower in growing and more likely to damp off with wrong treatment. The second takes more vitality from the parent plant, but they grow rapidly into flowering plants if detached, just as roots are emerging from the bases of the second year's shoots. This is the best period for valuable hybrids, because, if a young shoot should damp off, eyes remaining on the one year old stem of the offshoot will promptly function.

Offshoots are best potted into three-inch pots, but if they happen to be particularly vigorous, four-inch pots will be a benefit. Compost for offshoots should be sweet and open, consisting of strips of treefern roots, todea or asmunda fibre, with a surfacing of green sphagnum moss on which to rest the offshoot. Do not insert any



1. *Drainage.* 2. *Charcoal.* 3. *Fibre.* 4. *Treefern Fibre.* 5. *Sphagnum Moss.* 6. *Copper Wire Tie.* 7. *Aerial Roots.* 8. *Tie Stick.*

roots into the compost, the offshoot will do that when it is ready. All that is necessary is to keep the moss damp. Small crocks and charcoal will do to put over the drainage hole. A stake must be inserted rigidly so that when the offshoot is tied, it will not wobble about when the pot is handled.

A good method to adopt in potting offshoots is as follows:—Using three-inch pots, cut a piece of treefern root to the following dimensions—four or five inches long and roughly one inch squire or round. Place this in the pot and build up with the other materials. When the compost is surfaced with sphagnum moss, an inch or more of the treefern will be protruding, which can be used to strap the offshoot to, using fine copper wire. A short pointed tie stick can be inserted in the treefern if required. This method can be used for large plants also. Refer to the illustration.

Three useful features attend the potting described: (1) The projecting piece of fibre can be watered during winter without wetting the whole of the compost. (2) Roots penetrate the fibre with a tendency to grow up and down as they do when attached to a tree in the wilds. (3) When the time arrives for repotting the plant can be transferred to another receptacle with as little disturbance as possible, as a fair percentage of roots become imbedded in the piece of fibre, which can be included in the new compost.

(1) Those species that are more advantageously cut in their pots and left to develop the basal eyes include *densiflorum, thrysiflorum, formosum, infundibulum, Jamesianum, aggregatum, atroviolaceum, bigibbum, Brymerianum, chrysotoxum, Farmeri, Devonianum, Findlayanum, Gibsonii, macrophyllum, ochreatum, Parishii, Phalaenopsis, primulinum, pulchellum, speciosum, superbiens, undulatum, Wardianum.*

(2) Species that produce offshoots more or less freely, but which can also be treated as list (1) are: *amoenum, Bensoniae, bigibbum, chrysanthum, crystallinum, Devonianum, Falconeri, fimbriatum, heterocarpum* (aureum), *Hookerianum, Kingianum, lituiflorum, moschatum, nobile, Phalaenopsis, Pierardi, superbiens, undulatum, Wardianum* rather shyly, and many botanical species.

Cymbidiums: Practically the only serviceable method of multiplying this genus is to use the old back pseudo-bulbs. In all cases those that have lost their leaves are, more or less, a drain on the leading growths of the established plants. It is, therefore, more useful both for the plants, and for the purposes of propagation, to sever these inactive pseudo-bulbs while they are fresh and green. If the parent has been recently potted, or is not in need of immediate repotting, the pseudo-bulbs can be severed and left in the same pot with the parent until the time arrives for repotting. This obviates, for the time being, the trouble of labelling the nursery pseudo-bulbs, a precaution which must not be neglected when the pseudo-bulbs are removed to another receptacle. Be sure to have labels, or numbers, ready before severing pseudo-bulbs to be repotted, as confusion may result if a large number of plants is being dealt with.

Cutting and removing the back pseudo-bulbs require a fair amount of care and good judgment. An extra sharp knife, or a small pair of pruning shears, such as are used for pruning roses, will be necessary, as *Cymbidium* pseudo-builbs are generally harder and tougher than those of other species. Sometimes fresh roots remain attached to the old pseudo-bulbs, and these can be eased out with a strong stick; but usually the roots are senile, and of no use to the pseudo-bulb, and should then be cut away.

There is no hard and fast rule as to the number of pseudo-bulbs to be left attached when severed from the parent plant. If they are large and green, usually one pseudo-bulb will make one or more vigorous shoots, while if they are medium sized, it is an advantage to cut them into pairs, the very small pseudo-bulbs giving good results if left three together.

Pseudo-bulbs to be repotted separately should not be over potted, as the new shoots are likely to damp off if the pots become excessively wet at an unfavourable time. Excellent results can be obtained by putting small pseudo-bulbs into three-inch pots, medium sizes into four-inch, the large ones being placed in five-inch pots. Extra good drainage is a safeguard against damping off, while the compost should be neither rich nor heavy. The old pseudo-bulb will supply most of the nutriment for the first year's growth, when the young plant can be progressively repotted to a size or two larger each succeeding year, using more substantial compost.

It is not necessary, when repotting, to remove the old soil that adheres to the roots, and if the compost remains in a ball, all the better, being a great help to nursery plants, as they are more impatient in regard to disturbance than old established plants.

Reverting to the compost, the safest to use is very small lumps of osmunda or todea fibre the size of one's thumb, to which is added some pieces of charcoal, and small lumps of *very old* cow manure, at least two years old, and safer at three years old. The reason for this suggestion is, that cow manure up to twelve months old is usually infested with active or pupating insects, besides noxious bacteria and fungi. At two years old all potential pests have bred out and departed, and prolonged desiccation is detrimental to the activity of bacteria or fungi. Some growers advocate baking or burning the cow manure, but after the process it is not much better than charcoal in food values.

After filling the pot to within an inch from the rim, place a layer of sphagnum moss over the compost, then press the nursery pseudo-bulb into the moss, water and place it in a warm corner to stimulate growth. The genera *Coelogyne, Stanhopea, Zygopetalum,* and others of similar growth can be treated in the same manner with regard to nursery treatment, modifying subsequent potting and compost. *Thunia* can be handled as a *Dendrobium.*

Cattleyas are a little more difficult to handle than those species previously mentioned, owing to the requirements of a higher temperature to excite greater vitality in the dormant buds, and to keep them growing once they shoot. Many *Cattleyas* have rhizomes which creep a considerable length between pseudo-bulbs, hence they require more attention than *Dendrobiums* in keeping them within bounds.

To get nursery plants of *Cattleyas* by vegetative propagation, the usual method is to make a cut across the rhizome in front of a green eye, which is known as the primary eye. If the primary eye happens to be dead where it is necessary to make the cut, a secondary eye above it will probably function. The cut is regulated by the number of pseudo-bulbs, with and without leaves, it being safe to make the cut behind the fourth pseudo-bulb—the lead and three others—irrespective of how many remain on the back part of the division. If the plant does not require repotting the back cut can remain in the pot with the parent plant, but it is advisable to insert a stake to tie it up separately. Push some young green sphagnum moss under the rhizome to encourage growth.

If a plant is to be repotted, it is best to make the division after it has been removed from the pot, thus giving a better opportunity for inspection. Old back pseudo-bulbs without leaves are a source of exhaustion to those in front with leaves, and should be removed as soon as convenient. It depends on the condition of the old pseudo-bulbs as to whether one, two, or three will make a successful nursery plant. These can be potted as described for *Dendrobiums.* October, near Sydney, is a good month to operate on *Cattleyas* that are not about to flower. Where possible, nursery plants should be cultivated in the warmest part of the glasshouse, quick results being obtained if they are hung near the glass roof.

Laelias, and allied genera, require the same treatment as *Cattleyas.*

Epidendrums generally are simple subjects to deal with, the offshoot being provided with several aerial rootlets which sustain it until it becomes established. The compost to start with should be on the light side to encourage root action.

● *Cymbidiums* are accommodating subjects which thrive under various conditions of culture. Mr. W. Worth, of Willoughby, N.S.W., stands his pots in rows, on boards, on the ground. Between the rows he has slender shrubs and small deciduous trees growing which effectively temper the sun's rays in summer, allowing ample sunlight during winter. The numerous spikes noticed were abundant evidence to show that Mr. Worth's methods are favourable to *Cymbidiums. C. Gammieanum,* although a species with small flowers, made a gay showing, thirty-six flowers being counted on one spike. About twenty-five flowers may be considered a good effort for this *Cymbidium. C. giganteum* also does well for Mr. Worth, a variety much redder than the common one, being a pleasing contrast with *C. Gammieanum* Many of his hybrids had well developed buds on the spikes. Besides *Cymbidiums,* Mr. Worth has a nice collection of *Cypripediums* and *Dendrobiums.*—P.A.G., 4/5/1941.

● At the Seventh Annual General Meeting of the Orchid Society of New South Wales, held on Thursday, September 25, 1941, the following officers were elected for the ensuing year:—President, Judge H. F. Markell; Vice-Presidents, Mr. E. A. Hamilton, Dr. C. Jaede; Honorary Secretary, Mr. T. H. James; Honorary Treasurer, Mr. G. J. C. Tosi; Honorary Editor A.O. Review, Mr. P. A. Gilbert; Committee, Dr. J. C. Bell-Allen, Messrs. D. Adamson, F. Douglas, W. Fahey, C. C. Hildebrandt, W. Palmer, W. Worth.

Cool House Culture and Notes for Amateurs

T. H. JAMES, *Longueville, N.S.W.*

During the summer months there is little else to do among our Orchids except water them, and maintain a watchful eye for pests. This brief statement does not sound very strenuous, but the implementing of it certainly is. Continue to give all epiphytes as much water as circumstances will permit. I have stated in earlier notes, and again stress that I believe it impossible to overwater during our summer, provided compost and drainage are correct and ventilation ample.

Ventilation is a subject which in this country is much under considered or, perhaps it would be more correct to say over considered, and is based on old English text books without thought that here the conditions, particularly in Sydney and north of it, are suitable for growing most Orchids, including *Cattleyas,* in a bush-house during the summer, the only real protection necessary being from the south and west. So when I see growers stuffing up all openings and cracks with paper, and building glass-houses without any bottom ventilation whatever, and little of any other kind, I wonder what their plants will be like in a few years. Personally I try to make my glass-houses as airy as a bush-house. Further, in Nature, all plant life is accustomed to a lower temperature at night than by day, so don't close those ventilators at night, particularly during the warm weather.

Cattleyas.—The more I see of *Cattleya* collections, the more convinced I am that many, if not the majority of growers, are either intensely afraid of supplying water plentifully, or are so steeped in ideas obtained from old English text books or passed on from some other orthodox individual, that even the continued deterioration of their plants, or at least lack of improvement, does not suggest the possibility of their treatment being wrong and they blame the compost, lack of heat, etc. I know of one collection particularly, in which the *Cattleyas* had scarcely sufficient strength to stay erect without assistance. The house is never allowed below 60° F., and is too dry to grow anything well, let alone Orchids.

I know of collections where the water supplied is governed entirely by the reading of a hygrometer. Many successful growers do not possess such an instrument—the feel and smell of a house is a much surer guide.

My own *Cattleyas* and, in fact, all my Orchids during last summer were watered every evening except when the weather was wet or cold. And when I say "watered," I do not mean spraying the folaige and pots, or supplying a little water. Every plant was thoroughly saturated. The difference in growth was remarkable compared with that resulting from morning watering.

This watering introduces another matter. At a recent meeting of the Orchid Society of N.S.W., a member, Dr. C. A. Jaede, detailed the results of experiments extending over 18 months in conjunction with another member, Mr. G. H. Slade, in the use of Vitamin B1, of which those gentlemen will probably have something to say themselves. The effect of spraying Orchid plants and compost with a solution of this product resulted in increased plant and root growth, and larger flowers.

This Vitamin B1 is present in the kernels of seeds, and the spores of ferns and mosses. The moist condition in which my *Cattleyas* had been kept last summer caused the development of a very fine green moss-like growth, which has now spread to the majority of my Orchids and attached itself to all exposed roots. If there is anything in the theory and experiments of Dr. Jaede and Mr. Slade, it is possible that the spores of the moss on my plants have supplied that Vitamin B1, which is responsible for the exceptional growth now developing. The majority of my *Cattleyas* have produced two, and, in some cases, three new growths from the leading bulb, and many of the blubs behind the lead, and in a few cases all such bulbs have produced new growths. Some of these back bulbs have come away in two places. These back growths have developed without division. In one case a plant which two years ago had 4 bulbs but only one lead, is, this season, making eight new growths. A *Dendrobium x Merlin* which last year had two leads is now making ten new leads and so on. I do not know whether the extraordinary growth is resulting from the Vitamin B1 in the carpet of moss on the pots and baskets, or is due to a particularly vigorous constitution built up from the condition under which they were grown. During the whole of the winter the glass roof was clear and the temperature rarely above 42° F. and, occasionally,

BRASSOCATTLEYA HYBRID (C. Hassalli, alba x B. C. Madam Chas. Maron)
Sepals and petals white. Throat yellowish green. Nice form
Plant grown by T. C. Harveyson. Photo by Dorothy Coleman Studis.

down to 35° F. at dawn. The plants were watered lightly about once a week during winter.

There is one aspect of this heavy watering which seems to me important, and that is to exclude sphagnum moss from the compost. The sphagnum holds moisture too long and quickly decomposes, and I am afraid, in fact, sure, that under my conditions and treatment loss would result during winter of long cold wet periods.

In the growing of *Cattleyas,* and Orchids generally, I am in accord with the writer of "Meanderings of a Mug," which appeared in the March, 1941, issue of this Review with the one qualification as to light. Under glass some kind of light shading such as paint is necessary as otherwise the foliage would probably burn if the compost became dry. I, too, have heard it said, that deterioration would result from using any fibre except Osmunda. I have used Osmunda and black and brown Todea, and found no difference in growth, in fact, I am inclined to the belief that it matters not what the potting medium is, so long as it permits the free passage of air and water, and the growing conditions are good.

Six months ago two plants were potted in pure sifted tan bark, and made excellent roots and growth, but it is too soon yet to say if the results will be permanent.

My remarks concerning moss and Vitamin B1 may be quite wrong, but they suggest possibilities. Those who have imported Orchids direct from the jungles would have noticed that the roots and stems were frequently covered with moss or lichens.

There is one aspect of *Cattleya* growing in unheated houses which, I think, requires watching and that is the making of second growths in the one season. Some start early in the spring, grow rapidly, and flower before Christmas. A second growth from such can mature and flower before winter. In fact, three of mine flowered twice last season. Other types grow more slowly and second growths do not mature before winter. Up to the present I have found no instance of impaired vigour, but I am doubtful how long it can be maintained. These plants have been evolved to produce one growth each year, and I would suggest that, after a bulb has reached maturity, watering be reduced until flower buds show, then renew watering until the flowers are just about to open. After that keep them slightly on dry side, and remove to the coolest position available, and lower suspension. This might check any urge for new growth, and so promote a definite resting period.

The two most serious pests which attack *Cattleyas* are thrips and white scale. If plants are kept well watered and growing conditions moist thrips should not develop. I have never had it. But the white scale is very persistent, and does most of its work on the eyes of the bulbs. If ants are noticed on a plant, scale is generally present. The scale gets behind the sheaths and completely wrecks the eyes. All dry sheaths should be stripped. Also watch for blackened basal sheaths. It is generally a sign of water having got behind them, and might result in rotting of the eyes or even the bulb itself. Remove the sheath or partially strip it to allow the moisture to dry out.

Cymbidiums.—The disease which is attacking *Cymbidiums* in N.S.W. and Queensland is still undetermined definitely. One grower claims that it is a deficiency disease and that he believes he has found a solution. It is, however, too early to make a definite statement. Reviewing *Cymbidium* culture generally, I believe there is something wrong with our treatment. Once a plant reaches a flowering stage I think it should go on flowering each year, provided no deterioration sets it. I realize with Orchids, as with other flowering plants, that climatic conditions occasionally seriously affect results, but that is only occasionally. For the most part *Cymbidiums*—at any rate round about Sydney —flower far below what should be expected. I have seen them growing in all sorts of conditions, and in all manner of composts, and yet the average percentage of flowering is lamentably low. My own plants are no different from others. There must be a cause.

One grower claims that once his plants reach a flowering state, they continue to flower each succeeding year without fail, unless disturbed. He must be the proverbial exception. *Cymbidium grandiflorum* is notoriously difficult to flower around Sydney, and has possibly passed on this failing to its progeny. Again the vigorous growth of this species here, which often induces two or more new shoots from the leading bulbs, might contribute to the light flowering.

Other possibilities are the treatment of *Cymbidiums* as complete terrestrials in heavy composts whereas they grow naturally in the forks of trees. Certainly, in many cases, the roots reach the ground either down the hollow trunks, or under loose bark, but in the main they are in materials of a very light open porous nature, and not earthy composts. The lack of some essential chemical may also contribute.

I am trying out various treatments, but it will be some time before any results can be expected. I should be glad if readers would write to the Editor of this Review of any experiences of this subject.

Dendrobiums.—I have seen many *Dendrobiums* in flower this year as well as in previous years, but in only one instance have I seen them flower as they really should, and that is from the tip of the bulb to within a few inches of its base. Some other growers may achieve that result, but I have never seen it. I am not sure of the reason for the usual display of from one half to one third of the bulb, but believe it to be due to lack of sufficient water at the critical period of late summer and early autumn when the flower buds are forming under the skin. Unfortunately I seem to be away a lot during that period, and find my plants have been allowed to get too dry with the result that flowers develop on the upper sections only of the bulbs. *Dendrobiums* will appreciate reasonable applications of liquid manure. A good plan also is to topdress white peat moss and over that, place sphagnum.

The remarks in the opening paragraph of this article will cover types of Orchids not specially mentioned.

● ***B. C. Hybrid.*** (*C. Hassalli, alba x B. C. Madam Chas. Maron*).—This is a Charlesworth hybrid, so far unnamed. Shows good shape and form. Sepals and petals clear white and labellum heavily fringed, while the throat is a pleasing yellowish green. Potted in osmunda and polypodium in equal parts with plenty of drainage. The plant is grown in a warm glasshouse in the winter months and transferred to the bush house in October till May. Flowers in August with me.—*T. C. Harveyson, 5/9/1941.*

● Editorial matter, MSS., and photographs for publication should be sent direct to the Hon. Editor. The address is printed on the back cover.

CHANGE OF ADDRESS

● Readers are advised that in future the office of the *Australian Orchid Review* will be situated at the office of the publishers. Subscriptions and all correspondence should be addressed to *Australian Orchid Review,* Shepherd and Newman Pty. Ltd., Yurong St., Sydney. Phone, FA3178.

Orchid Culture

J. GORDON SMITH, *Brisbane, Q.*

● This subject opens up a very wide field for discussion, and for this reason I have divided it into three sections which I consider to be the most important in Orchid growing. They are light, water, and composts.

Light requires a lot of thought, and very careful consideration, as the correct light means a lot in the successful growing of Orchids. Too much light can be harmful, often causing disfigurement of the foliage; while a house that is too dark produces long weak growths with poor flowers, and the plants are susceptible to attack from all sorts of pests.

I am now of the opinion that many of my earlier failures were due to lack of light, which caused me a lot of trouble, and in common with most Orchid growers, I have my cemetery.

Starting off with a bush-house covered with wild May Bush, I soon got into trouble, for when the leaves dry they fall on the Orchids, often causing rot in the heads of the plants. Oiled hessian was proving to be a success in many places, so I decided to try it, and while it was a great improvement, trouble began to appear among the *Cymbidiums*, so I got in touch with a friend in the "South" who has a large collection of these plants, and he at once said "not enought light." So I was in trouble again. Hessian had given me food for thought, because it only lasted one summer, then rotted, and I wanted something that would allow the necessay light to reach the plants and be permanent.

Blinds appeared to be the answer to the problem, but I could not get blinds that would allow sufficient light in. Some manufacturers suggested taking out every second slat. This would mean a slat ⅞ of an inch wide, with a space of 1⅛ inches, which I considered to be too much. Eventually to get what I required, I had to make the blinds myself. They consist of a slat of ⅞ of an inch wide and ⅜ of an inch space. These allow plenty of light to reach the plants.

Water.—During the growing season, most Orchids require copious supplies of water, which must be reduced as the pseudo-blubs reach maturity. During the resting period, only sufficient water should be given to keep the bulbs plump. Plants that have no pseudo-bulbs, such as *Cypripediums*, must not be allowed to remain dry long.

There are very many ways of watering, but I consider it is wise to dip the plants at least once a week during the growing season, thus making sure that the compost gets a thorough soaking.

Composts.—There are many composts to be considered, all of which have given good results, but I do not advocate hard and fast rules for composts which often have to be altered to suit varying conditions. For general purposes, 60 per cent. of osmunda fibre, and 40 per cent. of polypodium peat give good results. *Cymbidiums* and *Cypripediums* require a slightly more retentive compost, so that the addition of well rotted turf, or leaf mould is necessary. *Vandas* do well in one part each of osmunda fibre, polypodium peat, pine needles and sand. For cold climates, plants such as Miltonias, equal parts of osmunda fibre and sphagnum moss chopped up and thoroughly mixed has been found to produce good results.

Some growers consider that it is necessary to feed Orchids to produce better growths and flowers, and many forms of fertilisers and manures have been used. There were two manufactured fertilizers on the market, while in recent months, Vitamin B1 has been used successfully in America, according to reports. I cannot make any suggestion in this regard, which I consider is purely a matter for the individual grower.

● Judge Markell mentioned at a recent meeting of the O.S. of N.S.W., that he obtains very good results from planting offshoots, or "aerials," in a mixture of peat moss and gravel.

● ***Combined Horticultural Council.***—At the show held in the City Hall on August 23, 1941, in aid of the Red Shield Hut Fund, several of our members assisted with a non-competitive exhibit which was greatly admired by the public, and appreciated by the sponsors of the show. We voice our thanks to those enthusiastic workers mentioned at the R.N.E. who again gave of their best to make the affair a success.—*Extract from the Q.O.S. Circular for September*, 1941.

● ***Corysanthes.***—A new species. In the Victorian Naturalist, Vol. 58, No. 6, October, 1941, the Rev. H. M. R. Rupp describes *C. Fordhamii*, from Brunswick Heads, N.S.W.

THUNIA MARSHALLIANA
Grown by Mrs. M. P. Campbell, Queensland. Photo by J. R. Bailey.

● ***Cymbidium.***—An Australian seedling. Mr. H. Oliver, Harrow Road, Auburn, N.S.W., has succeeded in flowering a *Cymbidium* which he propagated from seed derived from crossing *Loweo-eburneum* (seed-bearer) with *Pauwelsii* (pollen.) The cross was effected on October 4, 1933; the seed was sown October 10, 1934; plantlets were potted in 1936; flowered October 1, 1941.

Knudson's formula was used to grow the seed on, in the preparation of which Mr. Oliver received valuable assistance from Mr. R. Betteridge, chemist.

Sander's List of Hybrids records the cross under the name of *Diana*, Hassall 1916. The influences of *eburneum* and *insigne* are more apparent than that of *Lowianum*, these three species entering into its make-up.—P.A.G.

● The exhibits at the meeting held May 9, 1941, were commented upon favourably by the President. The *Cypripediums* shown by Messrs. W. F. Adamson and L. S. Smith were of good form and well grown. Mr. H. Campbell's *Vanda Sanderiana* was a nice plant and attracted much attention. Mr. Smolinski's *B.C. Oriens* (*C. Bronascha x Bv. Digbyana*), demonstrated our friend's ability to grow quality plants. Mr. Haenke's *Den. Phalaenopsis* var. *alba* was exhibited by Mr. W. Parton, who is caring for it during the owner's absence in Melbourne. The pot of *Vanda Kimballiana* shown by Mr. T. C. Harveyson had four delightful sprays which were much admired. The species seldom grows well in Queensland, but it is well worth trying, as it is one of the handsomest of the *Vandas*. —(Q.O.S. Monthly Review for June, 1941.)

● Membership subscriptions to the Orchid Society of New South Wales for 1941-42 are now due. Please post your remittance in the next mail to the Hon. Treasurer, Mr. G. J. C. Tosi, 39 Martin Place, Sydney.

A Patriotic Show in Newcastle

W. PALMER, *Drummoyne, N.S.W.*

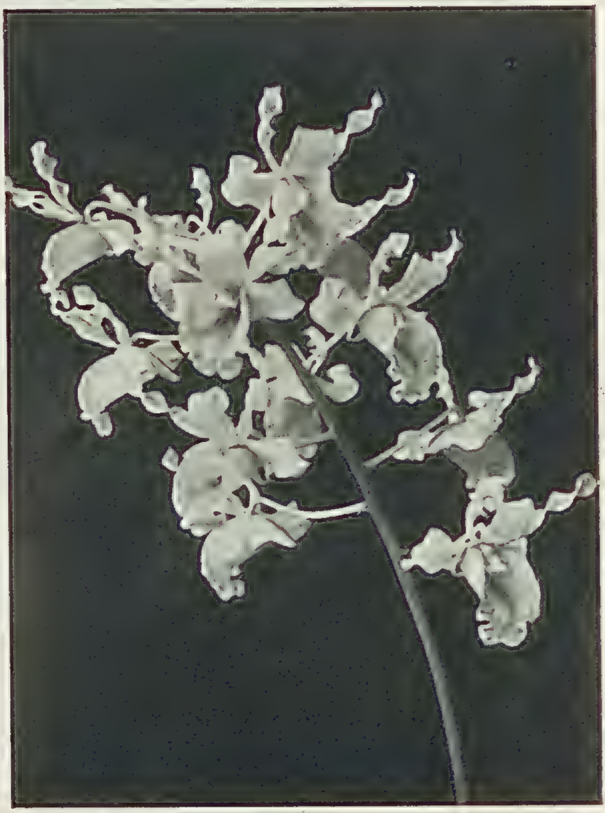
● At a combined Flower and Domestic Arts show held at Hamilton, Newcastle, on September 6, 1941, in aid of the local Red Cross and Comforts Fund, and opened by the Lady Mayoress of Greater Newcastle, Mr. Geo. Rundle, a member of our Newcastle Orchid Circle, staged an excellent display of plants in bloom, at the request of the committee. The display was staged on a stand twenty-five feet long by three feet deep. It comprised all the usual families grown by Orchid enthusiasts ranging from *Vandas* to *Cattleyas* and *Cymbidiums* to *Dendrobiums.* A total of 120 plants were shown. Two outstanding plants shown were *Oncidium splendidum* with its beautiful spray of yellow "Dancing Girl" flowers, and *Schomburgkia undulata,* with its spidery, purple flowers, carried on a long stem. The whole staging was arranged in the form of a pyramid backed by Cypresses, Adiantums, palms and Ardisias. The centrepiece consisted of two *Brasso-Cattleyas,* both large white flowers with deeply coloured labellums. These were *B.C. Thorntonii* and *B.C. Mde Charles Maron,* also the beautiful *B.C. Madeline,* with a large fine lip.

In the *Cypripedium* section, *Gowerianum* (green), *Lady Dillon x Garland,* two fine crimson flowers; *Sunshine x Anita,* a fine orange shade; and such old favourites as *villosum* and *hirsutissinum* were outstanding.

As usual *Cymbidiums* were the "Piece de resistance." These were used as a background to the other plants. *Enchantress* (green), *Peri* (green); a fine form of *Ceres;* the old favourite *Pauwelsii, Wheatear* (cream with a spotted lip), and *Charm,* pink. The outstanding *Cymbidium* was *Baldur* var. *Magnolia.* This flower was of a very fine creamy-pink in colour, the shape being the gladiolus type of hybrid—a really fine bloom carried on a firm spike.

Although rather early for *Dendrobiums,* some nice plants were on show, *nobile* in several shades, two varieties of *crassinode, Farmerii* var. *alba* carrying six trusses and nearly one hundred flowers being outstanding.

Several forms of *Phalaenopsis* were shown, notably *Schilleriana,* in three shades of pink; *Stuartiana,* creamy flowers with yellow markings. A fine *Vanda tricolor,* four feet high, and carrying two sprays of blooms, topped the pyramid. The show was very well attended, and Mr. Rundle being heartily thanked and congratulated by the committee and visitors for his display which certainly put Orchids a long step forward in Newcastle.



DENDROBIUM TOFFTII, *Bail.*
Grown by S. Brock. Photo by H. Pysden.

● ***Dendrobium Tofftii.***—The picture on the front cover is from a photograph received from Mr. S. Brock, Mackay, Qld., who writes: "My plant is grown on a tree-fern base, with the roots covered with good fibrous elk-horn peat, in a wooden basket. It flowers under glass in Mackay. Mr. A. Grant also is doing quite well with his plants under this treatment. The coastal conditions at Mackay seem to suit *Tofftii,* being, no doubt, closely akin to the conditions in its native habitat." In Vol. 5, No. 2, of this Review, an interesting note on the species appears over the name of Mr. W. F. Tierney, of Cairns.

Does Nature Rest in Propagating?

W. PALMER, ***Drummoyne, N.S.W.***

● This is a question of considerable interest to me as it is to many other Orchid growers. I felt rather diffident about writing on this topic, but having talked with several members of our Society, I am now more confident than before that the children of Nature do take a holiday from propagating at regular intervals.

As all growers are aware, there comes a time when some favourite plant, for no apparent reason, fails to flower, although it has done so year after year. Why? We take the plant down, tip it out of its receptacle, examine its roots and mixture, and if these are in good order, we put it back again, more puzzled than before.

Nature's method of propagating Orchids is almost entirely by seed. Whilst in their natural surroundings these seeds are germinated by the thousands, and only the strongest plants survive. If then, and I make this statement quite open to correction, Nature does not recuperate at certain intervals, why do the patches of jungle become bare of plants after a number of years. Surely the collectors do not reap faster than Nature propagates her plants, always remembering it is only the matured flowering plants which they gather. It is my opinion that if a portion of the forest could be segregated, it would be found, at regular cycles, that Orchids do not flower, but take a definite rest.

Under our natural (and in many cases it is so) methods of cultivating Orchids, if our plants do not flower at the usual season, we generally put this down to various reasons. Repotting the previous year, lack of roots, poor growths on bulbs, or careless watering which cause the buds to rot in their embryo stage, when none of these factors is in evidence. What then? I surmise that Nature is resting that season to gain strength for another flowering cycle.

From observations I have made over a number of years this resting period comes at intervals of six years. These observations are based on plants in my own houses and also in those of my friends. Only this season, *Cypripediums, Cattleyas,* and *Cymbidiums* are not flowering, although their growths are as excellent as in former years. I know of another case of an Orchid grower whose plants of *Dendrobium nobile* have improved in growth by a hundred per cent. this season, but strangely enough has practically no flowers. The same applies to plants in other collections I have seen in my wanderings.

To expect all readers to agree with my observations would be too much, but my suggestions at least will give growers room for observation and thought along these lines in the future.

A Note on the Manuring of Orchids

● Much has been written on the subject of the manuring of orchids, and extreme opinions expressed both for and against the practice. I have no doubt that judicious manuring is beneficial to plants which are in active growth; and it seems also clear that the manuring can take many different forms. I have not, however, seen any report on the use of commercial fertilizers for the purpose.

For some months past the majority of our Orchids at the Botanic Gardens (chiefly hybrid seedlings) have received either Enpekay or Ammonium sulphate, in dilute solution, at intervals of about a fortnight. The plants have made excellent new growth during this period and the colour of the new leaves is a good dark green. The majority of the plants are exposed to full sun during the day, but others under partial shade have been equally successful.

An advantage of the method is that the potting mixture is kept in a cleaner condition than if any form of organic manure is used. Formerly the usual manure was the liquid obtained from rotted groundnut cake. This promotes good growth, but it tends to foul the potting mixture, so that more frequent re-potting is necessary.

I have seen it stated that artificial fertilizers are quite unsuitable and even harmful for Orchids, but this is certainly not true, at least under open-air tropical conditions. It was intended that in the present experiments only Enpekay should be used, but on a few occasions Ammonium sulphate was substituted by mistake. It is no doubt desirable to make controlled experiments to find what composition of fertilizers is best suited to the Orchids; but comparative trials are difficult, as plants vary so much is size, etc. All the present note claims to show is that a commercial mixed fertilizer has had good results in promoting healthy growth of Orchid plants.—*R. E. Holttum.*

A New Way of Growing Aerides

EMILE GALISTAN

Reprinted from "The Malayan Orchid Review"

● The general method of growing Aerides may be taken as that described under "Cultural Notes" in Volume II. No. 1 of the Malayan Orchid Review, in respect of *Aerides Lawrenceae* and *Aerides suavissimum*. In this article, however, which is prompted by a desire to see more of this beautiful genus in cultivation, since there is an evident decrease in their number of late years, it is proposed to describe a new method of culture for the various species in local cultivation, which, from years of experiment has proved best for growing the plant to perfection. Aerides, as will be observed, like a vine, has a climbing habit, and, when grown in a pot, or teak basket, soon, when it sends out leads, as is its peculiarity, and gets top heavy, hangs over the side. This gives the plant an untidy appearance and detracts from the beauty of its foliage and flowers, which appears best when the plant is in an upright position. To overcome this disadvantage the plant, when fully grown in a pot or teak basket, should be transferred to a circular wire basket of a suitable size. Use ¾ inch mesh and for size of basket one of 14 in. in diameter by 12 inches in height, according to the size of the plant, should provide ample accommodation for future needs of the plant.

This basket should be provided with two thick wires each attached, at its opposite ends, to the side of the basket in a curve; the height of which should be ample for hanging the basket conveniently, and to which the plant may be tied to remain upright. For compost use *resam* (Gleichenia) roots and fibre chopped in equal proportion and packed tight. The coarser the compost the better it would be for drainage, although this hardly makes much difference since the amount of moisture remaining in the compost at any time is never too much to injure the roots, provided the basket is hung up and not put on a stand. Contrary to the general belief the wires do not affect or injure the roots in any way, although it is noticeable the roots appear to avoid the wire while making their way into the compost.

The plant appears to find all it wants in this method of cultivation, as it is always in full foliage and flowers at regular intervals.

As is well known another peculiarity of the Aerides is the large number of long fleshy roots which the plant sends out in increasing numbers when it is making good growth. It is this peculiarity which makes the epiphyte so difficult to cultivate suitably. In the wire basket arrangement, however, this difficulty is largely overcome, as the roots, when hanging outside the basket, can be made to turn to grow in the fibre. This will give a neat and compact general appearance to the plant, which, needless to say, adds much to its beauty, particularly when in flower. Aerides need partial shade, and a fairly moist compost for healthy growth. In the new method described requirements appear to be sufficient for the plant to be in the sun for the whole morning up to mid-day. The plant seems to like this, as the flowers produced under these conditions appear to have a deeper colour and last longer. Although the quantity of the compost used is adequate for the plant to maintain a healthy growth, this can, however, be quickened and the plant made to flower more freely and profusely if liquid cow manure is given to it occasionally. Care must, however, be taken that no sediment is left in the compost. This breeds insects, besides incraesing the amount of moisture in the compost which soon rots the roots.

Plants newly transferred to wire baskets should be gradually brought into the sunlight until the leaves are hardened to withstand the heat.

This should be done for an hour or so at a time, increasing the period gradually until the plant is seasoned to the sun. If plants grown in the shade, or even partial shade, are brought to the sun for long periods at a time the leaves soon get scorched and sometimes this is bad enough to kill the plant.

● *Royal National Exhibition.*—The President and Committee tender their best thanks to those who so kindly lent their plants for the occasion; to gentlemen who gave their valuable time caring for the exhibits; particularly to Mr. C. A. Hilsden, whose invaluable services in connection with transporting specimens both to and from the exhibition are greatly appreciated, and to Messrs. O'Keefe and Smolinski, who were continuously in attendance.—*Extract from the Q.O.S. Circular for September*, 1941.

The Cultivation of Phalaenopsis

EMILE GALISTAN

Reprinted from "The Malayan Orchid Review"

● Of the many species of this genus—commonly called the "butterfly Orchid"—*Phalaenopsis grandiflora*, probably one of the earliest to be imported, remains a popular favourite with collectors and nurserymen.

The fact that it is a free-flowering plant, easy to grow and cheap to buy, has no doubt contributed a good deal to its popularity. Unlike many species of this family *Phalaenopsis grandiflora*, the flowers of which have a high cut-flower value, is capable, with correct treatment, of growing to a very large size, with leaves four or five inches broad and over a foot long.

When the plant attains this growth it produces several flower spikes, and as many as twenty to thirty blooms have been seen on a single spike. The sight of these beautiful flowers, in their orderly array on long arching spikes, is a striking one.

Another peculiarity of the plant is that, very often, other branch spikes appear on the main one, as the flowers fade and fall off, these produce flowers in their turn. It is this succession of flowers, which sometimes lasts throughout the year, and continues as long as the plant is in full vigour of health and growth, that enhances its value and distinguishes it from others as a plant well worth the pains taken to grow it well.

It is, therefore, in the hope that a larger number of this beautiful Orchid will be seen at future Shows that the following cultural method, gained from personal experience, is offered, which, if followed, should result in the plant growing really well, if not to perfection.

In the method proposed the plant passes through three stages of growth, and taking it for granted that either a dormant plant, or one bought from the local nurseries, is intended to be grown, the plant should first be washed and trimmed of dead roots and leaves. It should then be tied, with some Asplenium fibre at the roots, to a piece of wood—preferably a round one—1 inch to 1½ inches in diameter and 6 inches long. The plant should then be hung in a cool place indoors, where there is plenty of air and watered frequently until new roots make growth. When well established, and the roots have well encircled the entire stick, the plant may be con-

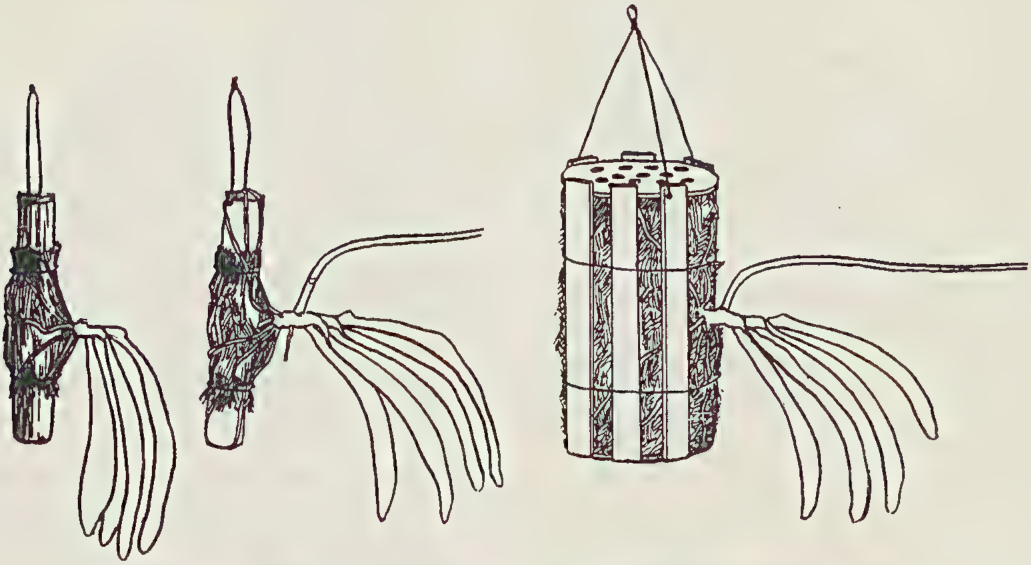


Diagram illustrating the three stages of treatment for Phalaenopsis Grandiflora sidered to have reached the second stage of its growth. It should then be given, once a week, liquid cow manure, by soaking the plant in the solution and washing the leaves afterwards. The plant will develop rapidly under this treatment, perhaps sending out its first flower spike, and should be ready for the next treatment in a month or two.

In the final treatment it will be necessary to have either a wire frame, or a wooden one, with open lattice work, in which to insert the plant, leaving the leaves to hang outside the frame, and an opening large enough to accommodate the stem of the plant conveniently.

Before inserting the plant in the frame prepare a quantity of shredded Asplenium fibre soaked in a thick solution of liquid cow manure. Have this mixture wrapped, in thin cloth to hold it in place, thickly round the base of the plant, covering the stick entirely. Then insert the plant in the frame, soaking it in liquid cow manure from time to time as the mixture diminishes or gets dry. The plant should, of course, be watered at least once every other day and kept in a cool, breezy, and shady place.

As a precaution against attacks from weevils, red spiders, and other insect pests, soak the plant once a week in a strong solution of tuba root.

If a wooden frame is used for the plant it will be a good plan, when inserting the plant in it, to fill tightly all spaces with the fibre, so that a plentiful supply of food is available to the plant for a long time.

● Mr. E. W. Usher has an outstanding Cypripedium in *C. Ayot St. Peter.* It is a good example of the horticultural ideals of the English growers, being nicely balanced. The dorsal sepal is round and flat, the labellum medium in size, the ventral sepal forming a modest background for the labellum. The petals are uniformly shaped, and in proportion to the rest of the flower. It was shown at the July meeting of the N.S.W. Society.

● Mr. W. Rothwell is to be congratulated on his very fine variety of *Cymbidium x Cyzarra* shown at the August meeting of the N.S.W. Society. The flower is very nicely shaped, possesses a prominent labellum, the colour being a rich shade of Orchid purple, as it appeared under electric light.

● Mr. Geo. S. Rundle, of Wallsend, N.S.W., has been appointed Honorary Secretary of the Newcastle Orchid Circle.

Giving the full face value

W. B. WORTH, *Willoughby, N.S.W.*

● Take a trip into any of our capital cities and look in at the florists' windows. The lovely creations that meet the eye will delight and inspire you, if you have a soul and an eye for floral design and colour.

The seasonable Flower Shows too, are a source of pleasure and wonderment to many.

Now these displays do not just happen to be beautiful. In all the decorations it is noticeable that carnations, camellias, daffodils, pansies, and the other choice blooms, are all placed with their wide open faces towards the onlooker. The flowers are selected at the right stage of development and beauty, and in fact everything is done to ensure that the blooms do themselves full justice.

But why is it, and I have noticed this for a number of years, that Orchids, the classics of the floral world, are displayed in a most haphazard manner?

To a true lover of the beautiful it distresses one to see a "Slipper" facing the floor, or a spike of *Cymbidium,* which if cut at the proper time would last many weeks in condition and beauty, but cut prematurely by, perhaps a fortnight, with its partly opened blooms rushed to the florist to be displayed, and there the whole thing weakly and unattractively drooping.

To me this seems just a waste of potentially good flowers and detracts from the public's appreciation of what should be the choicest subjects from the garden.

May I make a plea to readers? Cut your flowers as soon as, and not before they are fully developed, and if they are to adorn a shop window advise the decorator to supply a sufficient depth of water, to cut a little from the base of the stem each day, and to place the flowers so that the public will get their full face value.

If you grow your plants for your own enjoyment take the plant indoors, but here again, place it so that the blooms are displayed to advantage, and, believe me, an Orchid plant in bloom is a fine well-balanced subject for indoor decoration.

● At the September meeting of the Queensland Orchid Society the principal exhibitors were Messrs. T. C. Harveyson and L. S. Smith, their exhibits being mainly from the *Cattleya* tribe L.C.;S.L.C.;B.C.;C).

"Saying it with Orchids"

J. MURRAY COX, *Brisbane, Q.*

● It has been claimed by soothsayers that the name given in baptism influences the character of the individual, and this seemed to be borne out by Ethelbert Smithers. He was smallish and stoutish, and very, very mild. Certain ribald acquaintances have wondered how ever he went so far as to inflict the pangs of childbirth upon his mother; and equally puzzling was the fact that he had taken the plunge of matrimony—though in this latter case it is generally conceded that he did not marry his Diana, but that she married him. This may be so, for he had been left a very handsome estate by his grandfather, who was by no means mild, and who had accumulated much pelf from sundry adventures in black-birding in the early days of Queensland's sugar industry, and in other ventures of both sound and speculative character.

The old chap had been disgusted by his son's choice of a wife, and more so at her choice of a name for his grandson (Ethelbert's father having died before the birth of his son) and had he had any other relations, it is probable that he would have willed his considerable fortune to them. But little Ethelbert was the last of the Smithers, and the tough old salt had no option but to leave everything to him, or else bequeath his wealth to charities, or to movements for which he never had any sympathy. He did think of leaving everything to the Commonwealth Government to help pay for the War-to-end-War—but as that Government happened to be a Labour Government at the time he made his Will, and as he regarded Labour Governments as being even more poisonous than Ethelbert, that mild child scooped the pool.

He managed to survive the hell that awaits any mild youth, whose name subjects him to the indignity of being called "Ethel" by his schoolfellows, and in due course became of age and entered into possession of his fortune. Although mild he was not mental, and his first act was to convert all his grandfather's investments into hard cash as opportunity offered, and to reinvest the funds in non-taxable government loans. This gave him the very comfortable and carefree income of eight thousand pounds a year, more than enough to keep his extravagant Diana and her two extravagant children in reasonable luxury, and enable him to devote his attention to his two chief interests in life. These were the cultivation of Orchids, and, possibly a further inheritance from his grandfather, yachting. His diesel-engined cruiser "Sanderiana" was the finest craft on the Brisbane River, if not in the whole of Australia, and she was popularly reputed to be fit to circumnavigate the globe.

But Orchids were his chief delight. Almost every day from sunrise to sunset he spent pottering about his bushhouse and glasshouses, systematically examining each plant in his collection for signs of disease, evidence of growth or intention to flower. No development was too small for him to note, no discoloration of leaf too slight to catch his eye.

The crowning of kings, the rise and fall of dictators or democracies, the fate of peoples, governments and nations meant less to him than the finding of a flower spike upon *Vanda Luzonica* or a sheath forming upon one of the *Cattleya* seedlings he had raised from babyhood to maturity. The smashing of Czecho-Slovakia left him cold and he simply wasn't interested in the rape of Poland. He saw these things mentioned in his morning paper of course, but they meant as little to him as did the "Write-a-Title," "Pick-the-Winners" and other catchpenny features run by that limb of the Press combine.

His first awakening to the horrors of War came early in October, when, having cabled to his favourite suppliers, Vanda Jones and Co., for two hundred choice *Sophro-Laelio-Cattleyas,* he received a reply that no further orders could be despatched until after the War. He accepted the position philosophically, but couldn't see why Adolph Hitler's political or Imperial aspirations, in which he had not the slightest interest, should be allowed to interfere with his own private love for Orchid growing. Then he found that he could not obtain further supplies of his favourite slug-bait, "Gastropite." This ruffled his serenity for he had used that specific for years, and had no confidence in the substitute he was offered. "Send me out a bale of osmunda fibre," he said, "I'm getting rather low." "Sorry, Mr. Smithers," replied the florist. "I sold the last of it yesterday. That's another thing we'll have to do without until after the War. They can't spare space in ships for things like that during wartime. I'm afraid you'll have to fall back on todea fibre for a while."

"Drat it," exclaimed Ethelbert, with his first show of irritation. "It is very annoying. I don't care for todea at all. It holds the water too long and it sours very quickly. Something will have to be done about this war business. It's all very well for the people in Europe. They're accustomed to wars and seem to like them. But I've got nothing to do with this fellow Hitler. Why should he interfere with me? I'm sure he wouldn't want to injure my plants. Someone should get hold of him and make him see that he is becoming a nuisance."

He was a depressed little man as he drove homewards, but he was even more depressed when he arrived there and found a cable from his Panama agents informing him that a shipment of *Lycastes, Cattleyas* species, and miscellaneous South American Orchids which had been despatched to him had been sent to the bottom of the sea by a German raider. The monetary loss did not worry Ethelbert unduly, though he was by nature thrifty, but the thought of all those beautiful plants cast so wantonly to the bottom of the sea, infuriated him as nothing had done since his first schoolfellow called him "Ethel."

"If I could only see this man Hitler and reason with him," he sighed, "I might persuade him that it is madness for him to pursue this policy of warfare and destruction. He's probably never seen an Orchid and doesn't realise what he's doing."

And as other mild men have done he pondered over the problem of Hitlerism until dinner time.

. . . .

It being the first Wednesday in the month, the Smithers were entertaining the Hooksnips for dinner and bridge, Mrs. Hooksnip being Diana's sister. Ethelbert disliked these evenings, for he was not very keen on bridge, and, moreover, both his Diana and his sister-in-law Sybil were the types who ignore their partners' bids, and then when their own contracts have gone "phut," indulge in ferocious recriminations of their partners because they did, or didn't bid something.

To-night it seemed worse than usual.

"Ethelbert," snapped Mrs. Smithers, as she finished her dessert. "You have been sitting there goggling like a boiled prawn for the last five minutes, and Sybil has asked you twice if you'll let her have some Orchids for the ball next Wednesday night."

"Oh—yes—yes—sorry," stammered Ethelbert, "I am sorry, Sybil, but I'm somewhat distraught to-night. It's this beastly War business. But, of course I'll be happy to give you whatever blooms you want, Sybil. Let me know what frock you're wearing and I'll send suitable flowers to Rookens to be made up for you."

"What's the war done to you, Bert?" asked Harry Hoopsnip. "I didn't know you had any interests that would be affected. You're one of those lucky blighters with the wealth of Croesus and you neither delve nor spin and you don't pay Income Tax." "I have already had losses and inconvenience through the war," replied Ethelbert, with dignity. "Some two hundred pounds worth of plants have gone to the bottom of the sea, and if I order a replacement they will cost me about double, and may have the same fate. Potting material of the type I use is unobtainable and the insecticides and slug baits of most value are off the market."

"Oh, those eternal Orchids," cut in Diana. "Ethelbert never thinks of anything but Orchids. Even on our honeymoon twenty years ago it was all I could do to keep his mind on the business in hand instead of flitting off to his glasshouse. And if it's not Orchids it's that beastly boat of his. I feel seasick at the very thought of her. I wonder he doesn't sail over to Germany in her and make a special treaty with that Hitler person who's caused all the bother!"

The arrival of coffee ended the discussion, and shortly afterwards the party settled down to the wrangling of auction *a la* Smithers.

. . . .

Mr. Smithers twisted the wheel of "M.L. Sanderiana," and swung her between the buoys leading into Wilhelmshaven. A strangely altered launch this. The whole of her poop had been converted into a compact but roomy glasshouse, heated with thermostatically controlled power from the diesel engines. The plump little man was clad in yachting garb of neat cut and also in a dignity which would have surprised those who knew him intimately. He ran the craft alongside a pontoon, shut off his engine and threw a rope to a sailor in German naval uniform who was on guard there. She was soon moored fore and aft. Then having declutched his engine so that it could run without turning the propellers and so continue to heat the glasshouse, Ethelbert stepped ashore. The sailor exclaimed "Heil Hitler," presented arms, and then spoke rapidly in German.

Mr. Smithers performed what he believed was a British naval salute.

"I wish to see Herr Hitler," he said, firmly.

(*To be continued*)

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AUSTRALIAN ORCHID REVIEW

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The author of each article is responsible for the facts and opinions expressed therein

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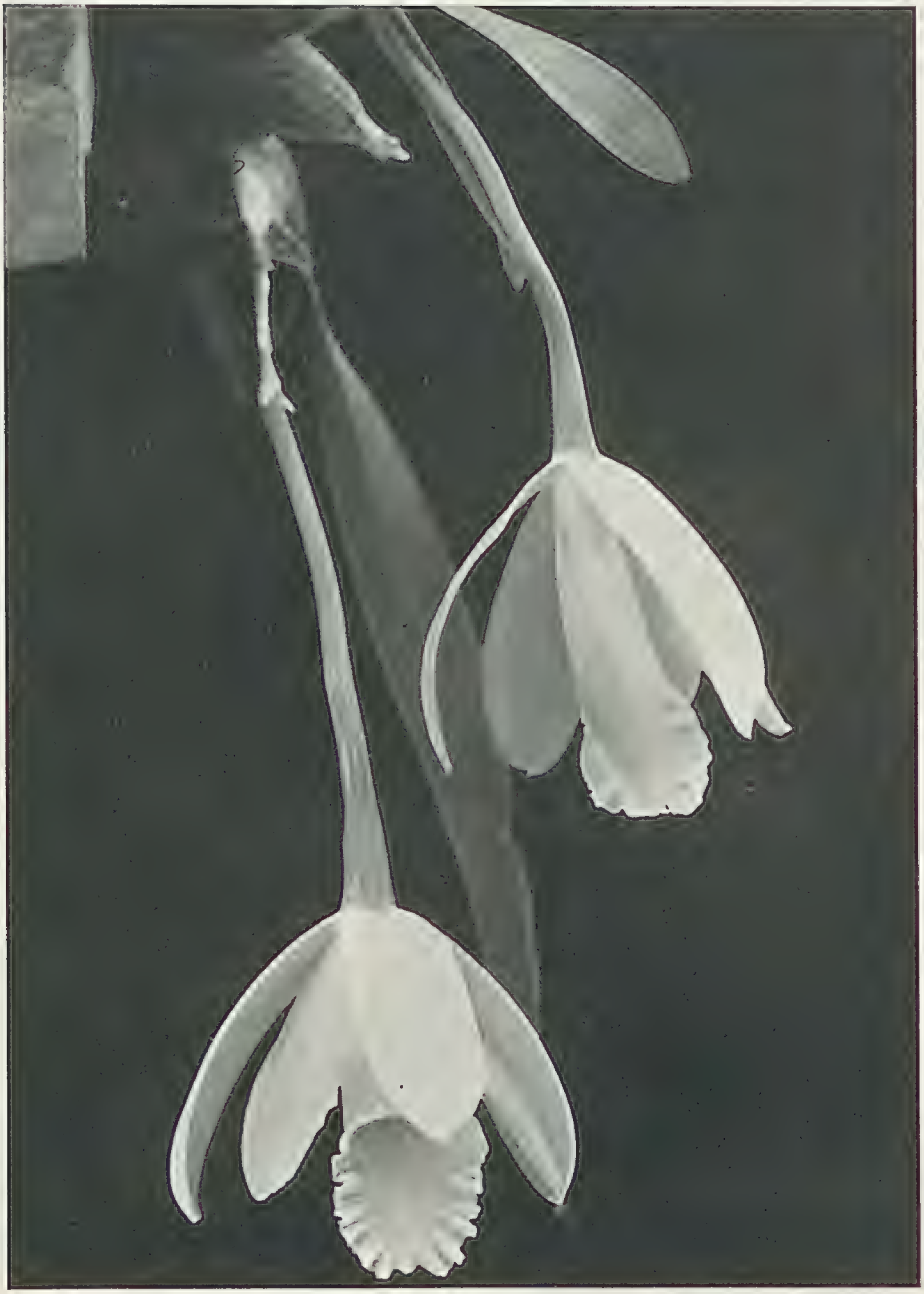


CATTLEYA CITRINA *Ldl.*
Grown and photographed by H. J. R. Overall, Manly, N.S.W.

Australian Orchid Review

Editorial

Orchid Hybrids

● The Addendum to Sander's List of Orchid Hybrids has been published for the years 1937-1940 in one part, and is ample evidence of the enthusiasm and enterprise of the publishers. The Orchid grower is fortunate in being able to procure this part, as Mr. Fred K. Sander says in the preface, dated New Year's Day, 1940, that—

"In spite of all difficulties we are glad indeed to be able to issue this Addendum to our Orchid Hybrid List. With the previous Addendas published in 1934 and 1937, the period of ten years since the completion of Volume II is now covered. All known hybrids named until the end of the year 1940 are included.

We avail ourselves of this opportunity to place on record our most sincere thanks to the American Orchid Society. Without their aid it would have been impossible to complete the work. Indeed we deeply appreciate their help, especially the zealous enthusiasm of Mr. and Mrs. L. Sherman Adams, whereby sufficient financial support has been forthcoming to place an advance order for the major part of the copies to be sent to the United States. Without this we should have been unable to obtain the necessary paper or permission to print the work.

With the return of normal times we hope in the not far distant future to resume the proposed merging of the whole: the two Volumes and three Addendas into a single continuous list whereby the quest for any hybrid or parentage will be simplified. Meanwhile with this present issue and some patience the origin of every hitherto recorded Orchid Hybrid can be traced, unnecessary duplication of names avoided, and a decision reached as to whether or no the plant may be christened."

New hybridists, new centres of hybridization, and new generic combinations make their appearances. The new countries raising original hybrids are Brazil, Ceylon, and Hawaii. The new generic hybrids are of particular interest to horticulturists, including some novel crosses. Here is the list: *Aerides* x *Phalaenopsis*=Aeridopsis; *Arachnis* x *Phalaenopsis*=Arachnopsis; *Arachnis* x *Renanthere*=Aranthera; *Arachnis* x *Vanda*=Aranda; *Brassia* x *Cochlioda* x *Odontoglossum*=Sanderara.

Another interesting item is a reference to certain *Miltonia* hybrids. "In 1938 we decided to discontinue the publication of direct Miltonia Hybrids. Our reason is that *Miltonia* Hybrids from the same seed-pod vary in a great degree, and almost identical forms are produced from differently named parents. At least nine-tenths of *Miltonia* Hybrids are, in fact, forms of *Miltonia* x *Bleuana*, the very large majority come from the two species, *Miltonia vexillaria* and *M. Roezlii*. The time has come to consider these *Miltonias* as garden forms and to give a suitable name to any outstanding variety. Hybrids that may be raised from other species than *M. Roezlii* and *M. vexillaria*, as also all bigeneric crosses we shall list as heretofore."

During the four years of recording, 680 new hybrids were added to the *Cypripedium* list, 190 to the *Cymbidium*, 185 to the *Cattleya*, and 250 to the *Laeliocattleya*. Some rather interesting crosses have been recorded in the *Dendrobium* list, a few of which include such species as *superbiens* and *undulatum* in their parentage.

It is to be regretted that events have caused almost a complete cessation in the hybridization of Orchids, and we may regard 1940 as the end of the first era in this fascinating work.

The price of the 1937-1940 Addendum is 15/- sterling, exchange and postal sundries in Australia would bring the amount up to £A1. The address is Sanders Ltd., St. Albans, Herts, England.

The Genus Dendrobium in Australia

C. T. WHITE, *Govt. Botanist, Brisbane, Q.*

● ***Denrobium,*** the largest genus of Orchids, includes about seven hundred named species, of which 59 are listed here as Australian, and all except three of these are found in Queensland, though many of the southern species are common to Queensland and New South Wales. The genus was founded by O. Swartz in 1799, and among the earliest described species was the Australian *Dendrobium linguiforme,* which Swartz described in 1800. The genus has a wide distribution through the tropics and sub-tropics of the eastern hemisphere, stretching from the Himalayas through India to the Malayan Archipelago to Australia, with one outlying species *D. Cunninghamii,* in Stewart Island, New Zealand. Northwards a few species extend to Korea and Japan.

The flowers range from insignificant to among the showiest of the family. The species are all epiphytic, though many grow on rocks as well as on trees. Some are very particular as to hosts, and in Australian trees the family Myrtaceae—*Eucalyptus, Tristania, Backhousia, Eugenia, etc.* —are favourite hosts of different species of Dendrobes.

What has struck me very forcibly in preparing this paper has been the number of doubtful records, and the number of very little known species, especially from North Queensland. There is evidently a big field here for the intensive study of the systematics of Australian Orchids in this area. Brief notes on all the Australian species follow:—

Dendrobium Adae: Native of North Queensland flowers sweetly scented, pure white or flecked with red.

D. aemulum: Box Orchid. Very common in coastal Queensland and New South Wales. Found in all forms. Common one in Queensland on Brush Box (*Tristania conferta*), also on Iron bark (*Eucalyptus paniculata*). Flowers white.

D. agrostophyllum: Confined to North Queensland. Flowers lemon yellow in colour, of rather rotund appearance.

D. atroviolaceum: This common New Guinea species with very distinctive flowers, the sepals and petals a rather greenish yellow, dark spotted and dark violet labellum, is represented in Mrs. Rowan's collection of Queensland wild flower paintings at the Queensland Museum. This, however, might easily have been taken from a cultivated plant. A correspondent sent me a flower from a plant in cultivation, which, he claimed, he obtained on Mt. Demi, Mossman River. I know, however, how easy it is to make mistakes with cultivated plants, and I prefer not to regard the species as a Queensland one until authentic specimens have been gathered.

D. Baileyi: A native of North Queensland, with long, slender stems, and grass-like leaves, sepals and petals, tapering to thread-like points.

D. Bairdianum: Small species, flowers at first a yellowish green, later buff-coloured.

D. Beckleri: One of the "Pencil" group of Dendrobes. Flowers greenish-cream. The segments narrow and streaked with purplish brown. Fairly common in Queensland and New South Wales. Frequently seen on the Swamp Oak (*Casuarina glauca*) and Hoop Pine (*Araucaria Cunninghamii*). The variety *racemosum* is a North Queensland form, with flowers in racemes of up to 10 flowers.

D. bifalce: This common New Guinea species was collected on Saibai Island by Hartmann, and must, therefore, be included in the list of Queensland Dendrobes. Saibai, though only comparatively speaking, a stone's throw from the mainland of Papua, is officially in Queensland territory. It is a smallish plant, the pseudobulbs fusiform and about a foot high. The flowers are in racemes of about 15 inches in length, with a few distantly placed flowers towards the end. The flowers are scarcely 1 inch in diameter, and are yellowish with a tinge of green, the segments somewhat leathery in texture and, except the labellum, incurved.

D. bigibbum: Widely distributed in North Queensland, amongst the best known of the Queensland Orchids. Three colour varieties have been described, var. *candidum* (var. *album*), with pure white flowers; var. *albo-marginatum,* with sepals and petals edged with white; var. *Georgei,* flowers dark violet-purple, the lines on the disc of the labellum with a dark, violet, not white, fringe and the middle lobe apiculate.

D. Bowmanii: Has been shown by Rupp to be a form of *D. Mortii.*

D. Brandtiae: Described by Krenzlin in 1906, and supposed to have been collected in either New Guinea or North Queensland. It is described as of the same habit as *D. Phalaenopsis,* but smaller, and the sepals and petals distinctly undulate.

D. canaliculatum: Commonly known as Onion Orchid or Tea-Tree Orchid, very common on Tea-Trees (*Melaleuca spp.*) in North Queensland. Very handsome when in flower, but difficult to cultivate—at least in Southern Queensland.

D. Carrii: Creeping species recently described from Mount Spurgeon, North Queensland. The flowers are white.

D. cucumerinum: Cucumber or Gherkin Orchid. Moderately common in New South Wales and South-eastern Queensland. Characterised by the leaves, which have the appearance of small gherkins.

D. delicatulum: Described by Kranzlin and F. Mueller in 1894 from Moreton Bay. It is described as about a foot high, the stems bearing several racemes of white flowers in the upper part. The flowers are small, scarcely ½ inch long, sepals and petals white, the apices suffused with rose.

D. delicatum: A very beautiful Dendrobe of the *speciosum* group. As far back as 1908, the English orchidologist R. A. Rolfe described a hybrid raised in England between this and *Kingianum* as identical with *D. delicatum.* It is a pretty plant sometimes seen at our meetings.

D. dicuphum: Fairly common in the Northern Territory. One of the *bigibbum* group, but the flowers are smaller, and paler in colour.

D. Ellen: An artificial hybrid between *D. Kingianum* (female) and *D. tetragonum* (male). It is illustrated and described by Mr. W. Schmidt in the *Australian Orchid Review* for December, 1937. (See also March, 1937, page 16).

D. eriaeoides: Native of North Queensland, where it forms large masses on tree trunks. The flowers are borne in racemes of 6-9, and are of dingy purplish colour.

D. falcorostrum: Beech Orchid. One of the most beautiful of Australian Dendrobes. Pseudo-bulbs, 12 to 18 inches long, often numerous borne in short racemes. Labellum spotted or streaked with purple. Found in mountain ranges (rarely under 3000 feet altitude) in Southern Queensland and New South Wales, as far south as Barrington Tops. Grows mainly on the Antarctic or Negrohead Beech (*Nothofagus Moorei*).

D. Fitzgeraldii: A synonym of *D. superbiens.*

D. Fleckeri: Recently described from North Queensland. Rather a distinctive plant. Sepals and petals yellowish green, the labellum splashed with purplish-red.

D. fuscum: This little-known species was described by Fitzgerald as far back as 1879, but is apparently very rare. In appearance, it is like a small form of *undulatum.* Mr. Weinthal, of Sydney, tells me he has consulted an unpublished sketch of the plant by Fitzgerald in the Mitchell Library, and that the sepals are shown without any twist, the petals twisted, and the colour a greenish-yellow.

D. fusiforme: Silver Orchid. Very common on rain-forest or jungle trees in North Queensland. Closely allied to *D. speciosum,* but much stockier growth and white flowers. Excellent photograph of this species by Mr. P. A. Gilbert in the *Australian Orchid Review* for December, 1939.

D. Goldei: This species is referred to by Kranzlin and most authors as simply a form of *D. superbiens,* with flowers of a deeper colour than usual.

D. Gouldii: I have included this common Papuan species among Queensland Orchids, as, according to the eminent Dutch orchidologist J. J. Smith, it has been found on Thursday Island.

D. gracilicaule: syn. (*D. elongatum*) is very appropriately named, as a characteristic is the slender nature of the pseudo-bulbs. The flowers are borne in racemes, and are yellow or yellowish-green, heavily blotched with reddish or brownish spots. Sometimes the spots are so thick as to become the dominating colour of the flowers, but at other times may be absent altogether.

D. elongatum: This name is sometimes used for *D. gracilicaule.* Cunningham's name, *elongatum,* though applied in 1839, was invalid, because of an earlier *D. elongatum* named by Lindley in 1830. Mueller's name of *gracilicaule,* though not applied until 1858, has priority. Lindley's plant, which is a native of Java, has been transferred to the genus *Sarcopodium,* but this does not alter the validity of Mueller's name, *gracilicaule,* which, under the rules of botanical nomenclature, must stand.

D. Grimesii: One of the "Pencil" group of Orchids, native of North Queensland.

D. hispidum: This has now been referred to the genus Cadetia.

D. Johannis: This Orchid, compared with its allies *superbiens* and *undulatum* is of small and slender stature. Flowers mostly brown with a yellowish tint. Both sepals and petals are slightly twisted.

D. Johnsoniae: This large-flowered New Guinea species is recorded by Kranzlin as growing in the Cape York Peninsular.

D. Jonesii: This species was collected in North

Queensland and sent to England, where it flowered and was described. Flowers white or cream coloured. It is described as very closely allied to the common *D. gracilicaule* of South-east Queensland.

D. Keffordii: A native of North Queensland, with long, slender stems, and narrow, grass-like leaves. Flowers are yellowish speckled with purple, petals and sepals tapering to long, slender points. It is regarded by some authors as only a variety or form of *D. Baileyi.*

D. Kestevenii: A native of New South Wales. Flowers white or cream.

D. Kingianum: One of the commonest epiphytic Orchids in South-eastern Queensland, though it is perhaps more often found on rock-ledges and on rock-faces rather than on trees. Flowers are mauve to very pale pink. Bailey recognises the variety *pallidum,* which seems only a colour variation, barely worthy of varietal rank; and var. *Silcockii,* with flowers pure white except the labellum, which is marked with lilac lines.

D. lichenastrum: First named by Mueller as Dendrobe and later changed to *Bulbophyllum.* Mr. W. H. Nicholls, the well-known Australian orchidologist, has a special article in the *North Queensland Naturalist,* Nos. 55 and 56, dealing with this and some allied species. He places it under *Denrobium.* It is a very small species with creeping stems and insignificant flowers.

D. linguiforme: Tongue Orchid, is a very common species with a wide range in Eastern Australia. In New South Wales it is recorded as mostly found on *Leptospermum* and *Backhousia trees.* In Queensland, mostly seen on paper-barked Tea-Trees (*Melaleuca spp.*). The leaves are short and togue-like, the flowers white and of a spidery character. The var. *Nugentii,* which occurs in several parts of North Queensland, is characterised by smaller flowers with comparatively broader segments. A flowering plant is very well illustrated in the *Australian Orchid Review* for December, 1939.

D. monophyllum: Lily of the Valley Orchid, is very common in South-eastern Queensland. Characterised by deeply furrowed pseudo-bulbs, 1-3 inch high, with a single leaf. The flowers are yellow in colour, very fragrant, nodding, and borne in slender racemes.

D. Mortii: Is one of the "Pencil" type of Orchids. The flowers are rather small, whitish or pale greenish in colour.

D. Mullerianum: Was described by Schlechter from specimens gathered on Mt. Bartle Frere. It is a small plant, about 15 inches high, which does not seem to have been collected since the original gathering by Stephen Johnson.

D. ophioglossum: This species, which was collected on the Challenger Expedition at Cape York, is known only from a single dried specimen in a very bad state of preservation at the Royal Botanic Gardens, Kew (England). It is apparently very close to the common Bottle Brush Orchid (*D. Smilliae*), but the flowers are described as pale yellow.

D. Palmerstoniae: Described by Schlechter from imperfect specimens collected by Palmerston on Bellender Ker.

D. Phalaenopsis: The emblem of the Queensland Orchid Society and the unofficial floral emblem of Queensland, is one of the most beautiful of the Dendrobes. The species probably finds its greatest development in the hillside "scrubs" in ranges west of Cooktown, hence commonly called locally Cooktown Orchid. It generally occurs on smooth-barked trees of the genera *Myrtus* and *Eugenia.* Several varieties have been distinguished. Var. *compactum,* of compact habit of growth and large flowers; var. *hololeucum,* flowers pure white; var. *Rothschildianum,* sepals and petals white, labellum light pink with darker lines on the disc; var. *Schroderianum,* sepals white, petals and labellum dark violet. A forma *album* has been described with flowers all white except a few purple lines in the throat; var. *Sietterianum,* flowers dark violet, labellum smaller than in the type.

D. Prenticei: A very small species from North Queensland.

D. pugioniforme: Dagger Orchid. Characterised by its glossy green leaves ending in a sharp point. Flowers are greenish, labellum white, suffused with red or purple.

D. rigidum: Moderately common in North Queensland, characterised by pendulous habit and short, thick fleshy leaves. Flowers of a pale buff colour, speckled with pale red outside, and tipped with pink on the inside.

D. Schneiderae: Small Orchid that occurs sparingly in the ranges of South-east Queensland.

D. Smilliae: Bottle Brush Orchid, very common in North Queensland. Flowers usually flesh-coloured tipped with green.

D. speciosum: One of the commonest and most widely-spread species in Eastern Australia. Very variable as to growth, and naturally in a species showing so much variation, many varieties and forms have been named: var. *curvicaule,* I have never seen this growing. The chief distinction, as given by Bailey, who described it, is that the stems are curved, some almost into a semicircle; var. *gracillimum,* in general appearance, this variety suggests a giant form of *D. gracilicaule.* Described by Mr. Rupp. It seems hard to distinguish this from Bailey's var. *nitidum,* and may be identical with it. Seems worthy of specific rank. Some beautiful specimens have been shown at the meetings of the Queensland Orchid Society: var. *Hillii,* common form in South-eastern Queensland, though the distinction between it and the normal form is not very clear to me; var. *nitidum,* named by F. M. Bailey, and is supposed to have come from North Queensland. I do not know the type, but would place several forms from southern parts of the State here.

D. striolatum: Another small species of the "pencil" type. Extends from the Blue Mountains, New South Wales, to Tasmania.

D. Stuartii: Small plant, native of North Queensland. Flowers old gold in colour, the spur and basal parts of the segments red.

D. Sumneri: A species collected near Cape York many years ago, and so far as I know, not obtained since. It is close to *D. bigibbum,* of which it may be a depauperate form.

D. superbiens: A species intermediate between *Phalaenopsis* and *undulatum,* and perhaps of hybrid origin. One of the most beautiful of the Dendrobes. A native of North Queensland

D. Taylori: This has been referred to the genus *Cadetia.*

D. tenuissimum: A small "pencil" Orchid from coastal New South Wales and South-east Queensland.

D. teretifolium: Pencil Orchid. This species has a wide range in Eastern Australia from south of Sydney to North Queensland. The flowers are white and spidery. Five varieties have been described. The typical form: flowers white or cream, sepals recurved; var. *Fairfaxii,* flowers white, sepals nearly straight; var. *aureum,* flowers yellow, or yellowish green; var. *fasciculatum,* flowers white, sepals slightly recurved, var. *album,* probably a synonym of var. *fasciculatum.* The last two varieties are confined to North Queensland.

D. tetragonum: Widely spread in eastern Australia, and commonly known as Spider Orchid, though in the southern States this name is frequently given to the common ground species *Caladenia Patersoni.* The chief feature of the species is its pendent four-angled stems. The sepals and petals are narrow, and the colour varies considerably from greenish yellow markings to reddish brown. P. A. Gilbert has a special article on this Orchid in the *Australian Orchid Review* for December, 1937, and recognises three varieties: var. *variabilis,* var. *giganteum,* and var. *Hayesianum.*

D. Tofftii: Tall stout species, pseudo-bulbs dark and prominently ribbed. It is one of the most beautiful of the Dendrobes, but extremely difficult to cultivate, at least in South-east Queensland.

D. undulatum: Tall stout species, very common in North Queensland, and growing in a variety of situations. Flowers are numerous in the raceme, of a dingy brown or old-gold colour, the sepals and petals more or less twisted. var. *Broomfieldii* is a beautiful variety, with flowers of a bright yellow; (var. *Carteri* is a synonym); var. *fimbrilabium* is a variety with much the colouring of the normal form, except that the labellum is a sulphur yellow and the lateral lobes fimbriate.

D. variable: Very small creeping Dendrobe recently described and figured by Mr. W. H. Nicholls in the *North Queensland Naturalist,* Vol. 7, Nos. 55 and 56.

D. Wilkianum: Is a species from North Queensland, recently described and illustrated by Mr. Rupp in the *North Queensland Naturalist,* No. 67 (December, 1941). The flowers are nearly two inches across the perianth, brown, the labellum yellowish green with conspicuous deep red lines.

● ***Import of Orchids.***—By Government proclamation the prohibition of the importation of Orchids has been extended to England and all sterling countries. All plants actually shipped prior to 8/12/1941 will be released on arrival without question. All plants not actually shipped, but for which documentary evidence can be produced that a definite order had been lodged with, and accepted by, the suppliers before that date, will be admitted on arrival, provided that, prior to arrival, such evidence be produced to the Department of Import Procurement and a licence to import obtained. The licences would be valid only until 31/5/1942. Any plants which, shipped after 8/12/1942, arrive without the cover of a licence or after 31/5/1942, will be liable to confiscation. Unless impracticable, the Department, whose Sydney address is 52 William Street, insists on personal application for licences.—T.H.J.

Vanda Coerulea

J. DEARING, *Elsternwick, Vic.*

● The photograph which I forwarded is that of a plant which I staged at our Orchid Club here in Melbourne some time ago, and which was adjudged the most meritorious exhibit at that monthly display. Many of our members with a wide and experienced knowledge of Orchids, considered it the best grown plant of this species they had ever seen. A close inspection of the photograph will show that it was carrying fourteen pairs of leaves, and the stem was clothed down to the top of the pan. It carried three spikes of bloom bearing an aggregate number of forty-eight blooms, the length of the spikes being nearly two feet. The flowers, although large and a good colour, were not as good a shape as the best varieties of this Orchid, but this did not detract from its effect.

I hope the following notes bearing on the cultivation of this *Vanda* may be of use to other growers who have difficulty in growing this plant successfully. Starting with this particular plant, I may add that it was purchased from Mr. J. Bisset, of Sydney, three years previous to when this photograph was taken. At that time it was newly imported. This, in my opinion, makes this plant the more remarkable, as, after three years' cultivation, it has not lost one of its original leaves, and has a stem of about two feet in height.

It was potted into a fern pan eight inches in diameter, about two-thirds filled with crocks, and the compost pressed in around the roots was composed of osmunda fibre and sphagnum moss. The plant, with others of the same species, was placed on the bench just inside the door of my house, and an empty five-inch pot was placed in a saucer of water, and on this empty pot the plant was stood, and the saucer kept filled with water. The practical reason for adopting this saucer of water method was that it must help to keep the roots more cool and moist, especially in our Melbourne climate, where we have such extremes in temperature, and more particularly in this case, as the door of my house is often left open during the summer months with a northerly wind blowing straight on to the plants. During the summer months the plant was sprayed overhead on warm days and water was freely sprayed amongst the pots on the bench. Although I grow a mixed collection of Orchids in this house, which is 30 feet long, 9 feet to ridge, and 5 feet 6 inches at sides, most of my plants are of the *Cattleya* and allied genera, though I grow a few *Phalaenopsis* very successfully at the far end of the house, nearest to the boiler. Also amongst my plants are a few *Oncidiums* and various other genera and a number of *Dendrobiums*.

I make no attempt to keep up temperatures as understood in England, as in my opinion this is unnecessary for the successful cultivation of nearly all Orchids. During the winter the temperature in my house will often be at 50 degrees F., or even lower, on cold nights, and may not rise beyond 60 to 65 degrees during the day on dull days. This *Vanda* is grown at the cool end of the house, and during the winter is kept much drier and is not sprayed overhead. When the spring comes with rising temperatures, then more moisture is given to the plants.

One very important item in the cultivation of this Orchid is that early in the autumn, when they are expected to bloom, get in early and look for the buds in the axils of the leaves, and if they can be seen, make sure there are no slugs nestling in the axils of the leaves. Next get a wad of dry cotton wool and place it loosely around the stem, just below the buds. This will tend to stop any slug eating out the buds of which slugs are extremely fond. A sprinkling of "Metabait" on the compost is a sure trap for any slug that touches it, and it does not injure the plant.

I had almost forgotten to give any details as to shading. My plants are growing on the west side of my house, which runs north and south, so that the sun gets on to that side of my house about midday and goes off late in the afternoon. The glass is coated with thin whitewash, and on this is a panel of laths after the style of the lath blinds, but with this difference: My laths remain on the glass during the hottest months of the year, and as autumn approaches I take them off, leaving only the whitewash. As winter approaches, I take off the whitewash until spring, when it starts to get warm again, so that for about four months of the year the plants get direct sunshine, and the tops of the plants are about a foot from the roof glass.

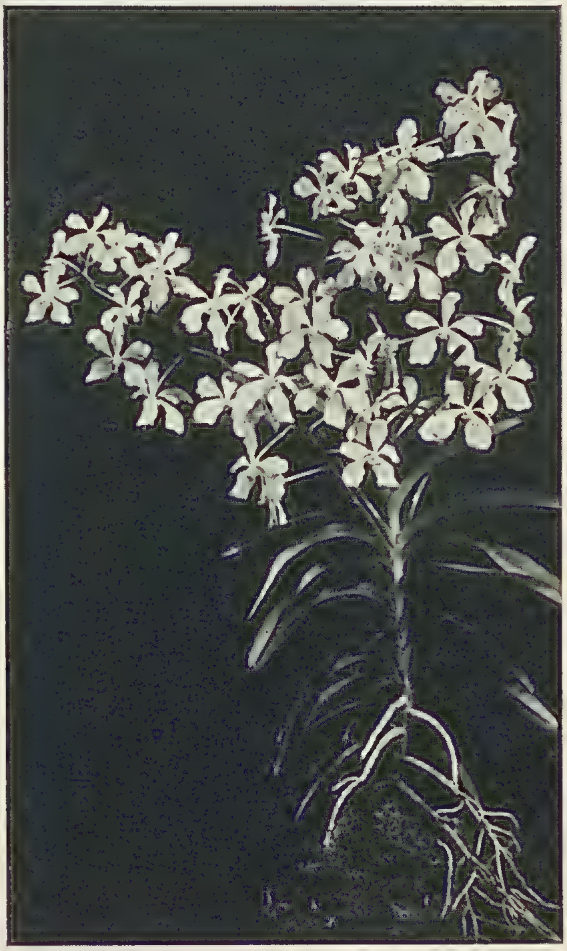
Now I have aimed at giving a correct record of the cultivation under which this plant was so successfully grown, hoping it will be of use to other growers of this beautiful Orchid. But let no one imagine for one instant that I am claiming to have solved the problem of growing this *Vanda* successfully. That day may come when other growers in different places and in different altitudes, and under various conditions, may meet with success. Then may I ask that they record their experiences and methods which they may think has brought about that success, and then when we have a mass of evidence for successful cultivation, we may be able to sift out the various methods and perhaps lay down rules for the successful cultivation of this Orchid.

It might be advisable to give a brief explanation of the difficulties concerned with the growing of this Orchid, more particularly referring to Melbourne conditions. Our climate in Melbourne is very changeable, particularly during the summer months, when it is possible to have a temperature of over 100 degrees F. in the shade, with a hot and dry northerly wind utterly devoid of moisture, and a sudden change of wind to the south may give a drop in temperature of 40 degrees F. or more. Some growers think this is one of our difficulties with this plant. The sudden change in temperature causing a check to the growing tips of the roots, and these sudden checks being responsible for the abortive root action. I certainly think these sudden changes are detrimental to the successful growth of any Orchids.

Possibly some reader of these notes may be puzzled about the difficulties I am referring to with regard to this Orchid, so I will try to explain. Briefly, the whole cause of the trouble is the abortive root action of this particular species of *Vanda*. The normal, healthy roots of any *Vanda*, *suavis* and other species, are long, clean roots, reaching out into the atmosphere, and when in growth the tops of these roots are green succulent tips, which represent the feeding portion of the roots. These roots extend and break out into other growing roots, and if left to themselves will take a grip of almost anything they come in contact with, forming roots many feet in length.

Now the trouble with *Vanda coerulea* is to get it to make these healthy roots. At its worst it forms growing tips to its roots as spring comes round, and temperatures rise, but it fails to keep on extending them. A rusty scaly film forms on a tip, and finally closes over it. In some cases this goes on at short intervals right through the growing season until it finally rests for the winter. The actual growth of the roots may not amount to more than an inch or two for the whole summer, and these roots are just a succession of rusty looking rings. In other cases the roots may extend several inches and then get a check and form a healthy tip and go on again, as no two plants seem to be affected to the same extent. At one time I had an idea that this trouble may have been caused by some mite or possibly fungus, but no evidence has come to hand to prove either of these as the cause of the trouble.

Now, whatever causes this trouble is, in my opinion, responsible for the loss of most plants of *Vanda coerulea*. If we can be assured by our methods of growing this Orchid, in developing and maintaining healthy looks, we will assuredly get healthy growth. The one must follow the other.



VANDA COURULEA *Griff.*

Three spikes of flowers carrying a total of 48 blooms; eleven pairs of leaves; has been in cultivation for three years at the time of flowering.

Grown by J. Dearing, Elsternwick, Vic.

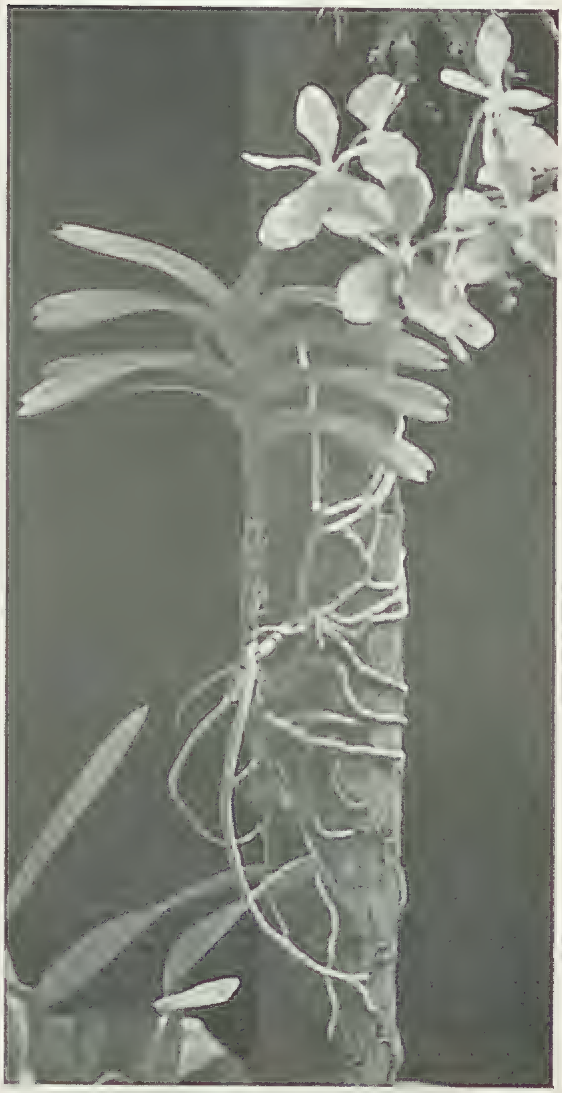
When this *Vanda* dies, it generally goes off with the centre of the growth dying as though water had lodged in the young growth and caused it to rot. In my opinion water is hardly ever the cause of its death, but possibly is the result of this unhealthy root action, the results of which must of necessity be shown in the young growth which is the living centre of the plant.

I am well aware of the statements of different travellers who have told us of the varying conditions under which this Orchid grows in its native state, but I have yet to hear of anyone making a success of it by subjecting it to frost during winter. I certainly do think that anyone aiming at making a success of this *Vanda* will have a much better chance if he is situated on some hills or mountains at various altitudes above sea level, and were I in Queensland or Northern New South Wales I should even try growing it on trees and leaving it to its fate I would have great hopes of success with such treatment if at an altitude of two or three thousand feet.

In the meantime, we can only carry out experiments and hope for ultimate success, and one other suggestion may help to bring this about, and that is to select plants which show the best resistant power to this root trouble, cross fertilise these selected plants, and raise seedlings, and it may be by using this line that we may eventually get a *Vanda coerulea* which will be resistant to this trouble.

● ***Bone Meal for Cymbidiums.***—It has been found that *Cymbidiums* respond very well to a little feed. We have experimented with a small batch for our own future use, and find that a little crude bone meal (pieces about ½-inch square) put amongst the crocks when the plants are repotted, and bone meal dust sprinkled over the compost is a big help. About May (November in Australia) get 3lb. of bone meal (dust or crude) and put into a tub containing ten gallons of water. Leave this for a week or more, and add a pint of this to a gallon of water when watering. Do this until the middle of October (April in Australia) and you will find that the plants benefit wonderfully. But only do it with *Cymbidiums.*—Mansell & Hatcher, England.

● *Cattleya citrina.*—An interesting Orchid from the mountains of Southern Mexico. The flowers, which grow downwards, are about 2½ inches in diameter. They are of a beautifully clean citron yellow in colour, sweetly scented and of a waxy texture.—H.J.R.O.



VANDA COERULEA *Griff.*

Grown and photographed by H. J. R. Overall, Manly, N.S.W.

● *Vanda coerulea.*—This photograph, which is much reduced, was made expressly for the purpose of showing the manner of growth. The flowers in this instance have been disregarded and are out of focus. The host is *Alsophila Cooperi.* A very small plant was tied on to the fern stem, and after a few months root growth commenced. This plant grows on the fern stem under Nature's frequently hard conditions, and flowers regularly at Easter time.—H.J.R.O.

● Editorial matter, MSS., and photographs for publication should be sent direct to the Hon. Editor. The address is printed on the back cover.

More Meanderings

"H.W."

● More than a year has gone by since my last effusion, and readers will be amused, perhaps interested, in my progress and thoughts, which have come to me on the way. First, I register my bewilderment at the style of nomenclature as applied to hybrids, the result is utter confusion. In any other branch of Horticulture one can be sure of getting when purchasing what one has on mind, either seeds or plants. Not so with Orchids.

Could one, for instance, after seeing and admiring a *Cymbidium "Swallow"* at a show purchase an identical plant by name? Having seen *"Swallows"* ranging from deep pink to white, and in all sorts of sizes and shapes, the aforesaid bewilderment put a very decided brake on my purchasing activities. Neither did it diminish when my own seedlings of this cross produced yellows among other colours. Here is a brief summary of 12 plants of *Swallow*, viz.:—

Alexanderi Westonbirt x *Pauwelsi magnifica*: One cross blush white, wide thick petals, somewhat incurved, like a waterlily; one white with pink flush, small flower like *Lowianum*; one white, with reddish pink markings, huge flower with medium width long pointed petals—the only one of this type; three yellows and yellow-buff, thick, wide rounded petals; six shades of white and pink, with various markings on lip from the faintest trace to the whole lip and throat covered with coloured dots arranged in lines, petals are thick and round. These are all *Swallows* according to the accepted nomenclature.

For myself, I am not bothering about *Swallow*, but naming each plant. Two are named already, one *Nymphoea*, the other *Winston Churchill*. The last name was shifted three times, and will, perhaps, be shifted again, as there are two more to flower. Not all my hybrids have flowered. About 75 per cent. did so, but every plant that flowered last year did so this year, with additional spikes and more numerous flowers. Those that did not flower are apparently enjoying life, for instead of flowering they produced up to six leads. I shall cut them up and start off again.

As for the species *Lowanium*, *Traceyanum*, *giganteum* and *eburneum*, every plant flowered, about 36 in all. *Grandiflorum*, as usual, produced nothing but leads, one plant must have 25 or more, and fills a stump 30 inches across. All excepting *eburneum* take a 2-inch larger pot each six months. *Eburneum* is much slower, but flowers well.

Attending Bissett's show at David Jones Ltd., left me rather critical of some of the prize-winners. Are we not getting away from the typical *Cymbidium* shape when we encourage the straightening out of all the petals? One prize specimen did not look like a *Cymbidium* at all, but reminded me of a huge *Poeticus Narcissus*. Being only a MUG I am wrong, of course, but it does seem to me a pity.

Friend James, whose articles cause me much pleasure, has expressed doubts about the lasting powers of leaf mould. He need not be afraid, the one point is to see that it comes from a sandy soil. I have used it in all manner of ways for years, and can assure him it will not break down as he fears, and anyhow, the application of the hose will wash it away like sugar. It is used on ALL the inhabitants of my Orchid, "Muggery," ranging from *Cattleya* to *Saccolabium*, for mysteriously, several other species have made their appearance alongside the *Cymbidiums*, and only the water shortage is preventing the appearance of many more. The "Bug" has got the "Mug" for a certainty.

Sandy soil leaf mould was specified as I have seen leaf mould (so called) that could be puddled like clay when wet. With this, Mr. James's fears would no doubt be realised. I have always a ton or so in varius stages, as nothing is burnt excepting twigs and branches, all sorts of rubbish such as old sacks and mats, even newspapers, are all rotted down. A very special variety which I am trying out on "Slippers" is made from barnyard grass—that "sticky-beak" winter grass that has such an affinity for socks and garments when in seed. This is pulled up when the flower heads show, as then it comes away with little sand on the roots. In a week it is dry, in two months if kept moist is half-rotted into a fibrous mass. Two or three inches of this in the bottom of a Cymbidium pot is never seen again, its place is taken by a solid mass of roots.

In six months it is quite rotten, is then passed over a sieve to get rid of sand, and mixed 50-50 with tan bark and used for "Slippers." The result so far is excellent. Why all this fuss about dirty pots? The best rock lilies grow on the dirtiest rocks! A dirty pot is my ideal, and with the idea of making it dirtier it was soaked in liquid manure, with disastrous results as the roots stuck to the pot and could not be separated by any means other than a knife. All my pots are left exposed to produce a patina, which I admire and the plants appreciate.

Curiously, while writing the above a report of the October meeting came to hand containing Dr. Hall's comments on mosses and lichens in nature. So a "Mug" can, at times, stumble on a new idea. B1 Vitamin has been tried, but produced no visible effect with as much as 1 mgr. per pot. My compost evidently contains all that is required.

Any disease? OH, YES! Plenty of it, but only in the *Cymbidium hybrids*. Probably they all have it, but they make so many roots and so fast that it has very little effect except with two or three plants. When they came to hand an expert showed me how to deal with them. He cautioned me to cut off all dead roots else the new ones coming through would rot. Quite explicit, if I had only been able to distinguish between sound and rotten.

The result was that many rotten roots were left on, in fact until the article in the *Australian Orchid Review*, I was unaware that any disease existed, and therefore the need of the surgical operation was not appreciated. One large named plant with six large back bulbs and one lead had what I now think was the disease, had the typical black spotted leaves. Doubts came into my mind, and the plant was put on one side for observation after removal of several back bulbs. The next lead produced had the typical black leaves, but as it gradually grew these new ones got lighter and lighter, until the last pair had none at all, though lighter spots could be seen when held to the light.

Another lead is now showing, and I am watching this with interest. All the back bulbs produced badly-spotted leaves on the first lead, but clean the second. Time will tell what is going to happen. The curious thing is that NONE of the species shows the slightest trace, and there are about thirty-six plants all from the jungle, BUT, a plant of *Insigne*, purchased locally and planted in fibrous rubbish, had it.

This gave me a Theory. You must have a theory to work on if only to let the other man prove you are wrong. *Cymbidiums* grow mostly on trees, and, therefore, after every shower, are saturated with an organic solution from leaves, bark, bird excreta, mosses, etc. Is it too much to assume that the deprivation of this solution is the cause of the whole trouble. It is not a fungus, the miscroscope says so. It may be a virus which attacks the plants when deprived of their natural nutriment, or it may simply be a deficiency disease. I am proceeding on this last. To quote friend James, "I may be quite wrong," then, again, I may not.

● ***Exhibits***—At the November, 1941, meeting of the Orchid Society of N.S.W.: W. Fahey, *Brassovola Digbyana, Miltonia hybrid, Cypripedium niveum;* T. H. James, *Cypripedium Hayneldianum, Cattleya hybrid;* C. Cambourn, *Dendrobium aggregatum, Dendrobium crysotoxum, Laelia purpurata*; P. L. Meech, *Lycaste auromatica*; E. L. Hayes, *Cypripedium, Dowlerii;* H. Walters, *Cymbidium aloifolium;* Judge H. F. Maxwell, *Epidendrum atropurpureum.*

● ***Exhibits.***—The following were noted at the December, 1941, meeting of the Queensland Orchid Society: Fred E. Todd, *L. C. Alata* x *L. C. St. Gothard, C. Henschelli x L. C. Warscewiczi Majestic, Thunia alba;* F. A. Farr, *Cyp. callosum*; C. O. Dunn, *Thunia Marshalliana, alba*; C. A. Hilsden, *L. C. Medusa* and three *Cyps. callosum*; Harold Campbell, *Catt. Polling, C. Warnerii* x *Lustre, Cyp. callosum*; S. E. Golik, *Thunia Marshalliana, alba, Cyp. bellatulum*; J. Smolinski, *Dendr. superbiens*; T. F. Donnelly, *Cyp. niveum, alba;* T. C. Harveyson, *Cyps. callosum* (2), *berbatum, niveum alba, Aerides, crassifolium and falcatum, Phalaenopsis amabilis grandiflorous*; H. J. Fensom, *Cyp. callousum.* Alhough the exhibits were few in number, the magnificent plants of *Cyp. callosum* shown by several members were a beautiful sight, and caused much favourable comment.

● At the December, 1941 meeting of the O.S. of N.S.W., Dr. Vote exhibited a fine plant in flower of *Selenipedium x grande* (*caudatum* x *longifolium*). It was one of the outstanding floral exhibits of the year, the quaint and handsome flowers of the vigorously grown plant attracting all present.

CHANGE OF ADDRESS

● Readers are advised that in future the office of the *Australian Orchid Review* will be situated at the office of the publishers. Subscriptions and all correspondence should be addressed to *Australian Orchid Review*, Shepherd and Newman Pty. Ltd., Yurong Street, Sydney.

Cool House Culture and Notes for Amateurs

T. H. JAMES, *Longueville, N.S.W.*

● The dominant question with all Orchid growers and, indeed, all gardeners, in the Sydney area and possibly other districts also, is water. The gloomy possibility mentioned in my notes in the last September number of *The Orchid Review* has become an actuality, and a tragic one. At the time of writing these notes the arrival of substantial rain seems as far remote as it has been for some years past. I would dearly love to be able to say all that is in my mind, even for the mental satisfaction that seems to follow a good cussing when exasperated, but when I see the tragedy of wrecked gardens, many of which have taken a generation or more to build, I am sure the thoughts of those other gardeners are akin to my own, and there is, therefore, no need for me to give mine expression to be understood.

However, the water is not available, and for the present we have to submit to circumstances. Some had sufficient foresight to install tanks; some even had a motor and rotary pump attached, which gave ample pressure. Others were fortunate to be resident in a district in which bore water is available. But many were caught without tanks, and war conditions rendered their acquisition a matter for the future. Personally, my water storage was limited. I tapped the roof gutters and obtained a moderate amount of water in large drums and casks. To make this serve I implemented my own suggestions outlined in last September Review, and was surprised at the small amount of water required to keep my Orchids growing. The less said about the labour and time involved the better.

All *Cymbidiums* were set into the ground on the eastern side of a fence to pot-rim level and heavily shaded. I found that after a good watering the plants kept moist for at least two weeks, even during the very hot early January days. As a matter of fact, I really believe they are looking better than hitherto, possibly due to coolness of the roots. It is astonishing what an amount of dryness *Cymbidiums* will withstand if their roots are cool. I have some growing in old tree stumps on the mountains. There the drought has been as severe as in Sydney, and, except for a little water at long intervals, they have had to contend with the general dry conditions. They have not flourished, but they grow. Their roots have probably gone deeply into the hollow stump, which has saved them. In pots above ground they could not possibly have survived. And so I believe that large pots would carry on for much more than two weeks without water, treated as I have outlined.

All other Orchids are watered by being dipped in a tank. To conserve moisture pots and baskets have been topped with moss, and I find that each dipping will keep the plants moist for from two to four or five days, particularly if done in the evening. To me, the extra time available in the evening is the only asset in daylight saving. From March onwards, watering, even without rain, will ease somewhat.

Light.—As autumn arrives and passes, provide more and more light. During last autumn and winter practically all paint had washed off my roof, and in winter particularly I am sure plants appreciate all the sunlight that can be provided.

Last spring, when I found coarse scrim was unobtainable for blinds, I gave my roof a light coat of mill white to which a little linseed oil had been added. Without oil it will quickly wash off. The summer has, I believe, been hotter than usual, and yet there has been no burning of foliage whatever. Growth is luxuriant, and even *Cypripediums* seem to appreciate the bright light, although they are generally supposed to prefer somewhat shady conditions. This year's experience has satisfied me that provided the plants be kept damp and the atmosphere humid, blinds are quite unnecessary.

Manuring.—This perennial subject has again come up for discussion at recent meetings of The Orchid Society of New South Wales. Several growers have suffered considerable losses due to excessive supplies of nutriment. Some growers contended that good cultural treatment rendered any nutriment unnecessary. Others, that the plants received no fertilisers in their native habitats, and should, therefore, require none under cultivation. I disagree with the last contention, and believe that in their native state they receive quite an amount of nutriment from the chemicals in the copious rains, dust, decomposing rock, and vegetation. Their roots cling to rocks and tree trunks, and penetrate cracks and

LYCASTE SKINNERI *Ldl.*
13 *blooms*
Grown by W. Fahey, Waverton, Sydney. Photo by Turner Studios.

corrugations. They are mostly exposed to the air (I am referring, of course, to epiphytes). Under cultivation the roots are mostly confined in pots and baskets, and they are deprived of rain. In the circumstances I consider that reasonable amounts of nutriment should be beneficial. One point, however, should be very definite. Nutriment should be supplied solely as a food, and not as a stimulant. I understand that scientific experiments show that plants will benefit from nutriment supplied up to a certain point, but when saturation has been reached the whole plant structure collapses, resulting in early death. This action would seem to explain the losses referred to in these notes. This feeding of Orchids is done extensively in the U.S.A. and the East, and the records report no losses following its judicious application.

Cattleyas.—I am having the same trouble this year as last, although not to the same degree, in stopping my plants from making a second growth. The fact that they are sending up flower buds makes no difference. I have some actually in flower and others with buds well developed which are again shooting. I have tried a certain amount of drying but with no success. Possibly the intense humidity of the house and the absence of all shading, other than a thin coat of paint, may be partly responsible. I am afraid a continuance might later interfere with flowering.

Generally I ease off the water and move to the cooler portion of the house when the leaf has finally emerged from its sheath and until flower buds appear, to assist the bulbs to mature. As autumn advances remove the moss from the pots and baskets and give just sufficient water to prevent shrivelling.

Cypripediums.—Flower buds are now appearing, in fact, some of the very early types, such as *Charlesworthii*, are well advanced. Care should now be taken with overhead watering, more so in the glass-house than in the bush-house. Water remaining overlong in the leaf axis is apt to rot the buds. When the flower stem appears all danger of rot has passed. In the open the greater air movement minimises the possibility of rot.

During this period watering would be simplified by re-grouping the plants. Those that have buds just developing being separated from those with buds showing stem or not yet due to flower.

Less water also will be required as winter approaches, but where tan-bark is used water will be necessary at least twice a week, even in winter. All moss or other mulch used to conserve water on account of restrictions should be removed. During the summer I gave most of my *Cypripediums,* at intervals of six or eight weeks, about half a teaspoon of bone dust. I sprinkled it on top of the tan-bark and then watered. The fine particles were immediately taken up by the water and some of it, no doubt, was carried away by the excess water. The coarse particles remained for some weeks before finally disappearing. The plants are certainly growing vigorously and are a deeper green than hitherto, and promise plenty of flower.

Cymbidiums.—Some of the larger collections have been so heavily shaded to conserve water that it is possible there will be a smaller showing of flowers this coming season. On the other hand, many plants will have been much drier than in the past, and this may induce heavier flowering. The exceptional conditions may possibly produce some very practical results. For those whose plants are receiving normal treatment I would suggest less water until flower spikes are evident. Occasional applications of weak nutriment would improve the flowering.

Dendrobiums.—These will shortly be maturing their bulbs. Provide as much sunlight as possible and keep the water going until growth is quite complete, then lessen the water, but plants should not be quite dry. Flower buds will begin to appear in June. I have treated my *Dendrobiums* similarly to the *Cypripediums,* that is, the application of a little bone dust. The response so far is most satisfactory.

Miltonias.—My plant of *Miltonia spectabile* is still flourishing amazingly. The way this plant grows on a piece of hard Java fibre without moss and no manuring seems to upset my ideas regarding plants in nature and those in glass-houses *vide* notes on manuring. The bulbs get larger each year and increase in number. This year it has nine leads, seven of which are flowering. I have lately obtained three other species and placed them also on blocks of fibre. They are already rooting freely.

Some Notes on Raising Bletia from Seed

Mrs. E. C. PITT, *Oakleigh, Vic.*

● I purchased a bulb of Bletia. In due season up came the long ribbon-like leaves; the flower following later—a beautiful mauve, with paler labellum finely striated and delicately poised.

When mature I hand-fertilised it, and a firm, well-filled pod of seed developed, which I gathered in the autumn, and stored until the spring.

Having no glass-house, I made use of a warm corner in a glassed-in verandah, where I have shelves for a few Orchids, and such experiments as the following:

From a bath-brick I cut several small blocks, each measuring 2 inches by 1½ inches, these I thoroughly boiled for some minutes, then on to each I lightly sprinkled some seed. With wire I suspended each block into a wide-mouthed, deep glass jar, filled to about one-third with water, allowing the block to just touch the water, thereby preventing it from becoming too heavily soaked with moisture.

In about 10 to 14 days a pale green film appeared, and examining it through a hand lens, I found a forest of tiny leaves—the first leaves of the young plants. Very soon the second leaf appeared to each minute plant, and I became impatient to transplant them. What to plant them in and how to keep the same temperature as that in the bottle in which they had germinated were my problems.

I obtained several thumb-pots and more deep jars. I filled the pots with finely-sifted leaf mould and sand; on to each pot I transferred 12 to 15 tiny seedlings and placed it in a jar. At the bottom of the jar I had a piece of brick to the level of which I had water, thus, as far as possible, maintaining the conditions of germination. Growth was very slow after this, and the development of a blackish fungus destroyed more than half of the plants. As the remaining plants grew stronger I removed them from the bottles for some hours daily, thus gradually accustoming them to natural conditions.

Though slow in growth, they appeared strong and even vigorous, many putting on four leaves. After the fourth leaf growth they seemed to stop and continued dormant far into the winter, when the blackish fungus appeared again, killing all but one solitary plant, which continued growth in the spring but finally succumbed.

I now have another pod ripening, and I hope to experiment further with better results.

Observations

J. GORDON SMITH, *Brisbane, Q.*

● Orchid growing in Queensland presents many interesting features, due mainly to varying conditions. There are Orchid growers in most of our coastal towns, and when you realise that in proceeding north the Tropic of Capricorn is crossed at Rockhampton; that the distance from Brisbane to Cooktown is approximately 1150 miles; consider the position of the town in relation to the sea, then you will readily understand the variation in conditions existing in this State.

Speaking from the point of view of a Brisbane grower, I consider that the most noticeable change takes place at Mackay; the growers of that centre have much better conditions than we enjoy here in Brisbane, and consequently their blooms are produced about three or four weeks ahead of ours. Proceeding north from Mackay to Townsville, the change is very gradual, but from Ingham, just north of Townsville, to Cairns, the conditions for growing Orchids generally are very good. It is in this area that the rainfall increases considerably, and consequently there is a longer period of humid weather, which of course produces more rapid and stronger growth. From this area we get such plants as *Phalaenopsis amabilis* var. *Rosenstromii, Dendrobium Toftii,* and just north of Cairns, *Dendrobium Phalaenopsis,* probably the best of the Queensland Orchids.

These features came to my notice after a trip through the North, and from talks with the late Mr. William Anderson, then Curator of the Townsville Gardens. His methods were very simple. He had an old bush-house in which he grew Orchids, palms and ferns. On the posts which supported the roof of the bush-house he grew *Phalaenopsis amabilis* and *P. Schilleriana.* In the first place they had been strapped to the posts, with straps of leather; this, of course, left the roots free to wander about the posts, and if length is any indication then those roots certainly appreciated freedom. What plants they were! They made me green with envy. Whenever I called, those *Phalaenopses* were in bloom, and what spikes, and what flowers! I have never seen their equal. The plants had six to eight leaves, and those leaves, fully grown, were sixteen to seventeen inches long, the plants being hosed when the palms and ferns were watered, otherwise they got no attention.

Another grower in this town grew his *Phalaenopses* on pieces of cocoanut husk, and while he got very good results he never produced plants or flowers to equal those that I have previously mentioned; but his home is on the foreshore, or about a mile nearer to the sea than the Gardens.

Cairns growers have got very good results by growing terete *Vandas* in the open garden, these plants appear to revel in direct sunlight, for, grown in this way, they grow well and flower well. Cairns growers are also succeeding with some of the Indian *Dendrobiums,* which we find troublesome, such as *Dendrobium crassinode, D. Findlayanum,* and *D. Wardianum.* In Abbott Street, a main thoroughfare of Cairns, there is a giant fig tree, probably a relic of the days before Cairns was built. However, there it continues to grow, and to act as host for a number of *Dendrobium teretifolium,* which were in bloom in September, and one could not fail to notice their perfume when approaching the tree.

A citrus tree which is the host for a number of *Dendrobium Phalaenopsis* has been of interest to me because a number of flowers were inoculated, by what agency or with what pollen one cannot say, but seed formed and dropped on to a piece of rope hanging from the tree, there they germinated and continue to grow. At the Kuranda railway station there is a tree fern on which a number of seedling Orchids appeared; blame the birds, insects, or the wind, it matters not which, for how the seed got there is purely a matter of conjecture. Year after year I have watched those seedlnigs grow, increasing in size each year, and, on my last trip, in September, I noticed that one of them, a *Cymbidium,* had flowered.

Possibly the longer hours of daylight, the longer period of humid weather, and the shorter and milder winter of the North, all play an important part in the life of the Orchid.

● "As an old reader, may I tell you how very much I enjoy and appreciate the *Australian Orchid Review.* It is a bright spot in these dark days through which we are passing. I look forward eagerly each quarter for its arrival."—E.C.P., Oakleigh, Vic.

● Articles and notes on Orchid lore are required for this Review. The simplest observation may be of great value to some other Orchid enthusiast.

Cultural Notes For Brisbane

J. MURRAY COX, *Brisbane, Q.*

● ***March:*** We are now on the downward path of the climatic year. The days are shortening, temperature is declining, and the rainy season is nearing its end. Our plants have nearly completed the growths from which we expect our next flowers. As each plant finishes its seasonal growth its water ration should be decreased, thus allowing the new pseudo-bulbs to mature for flowering. Where growth is still in progress watering should be maintained in as great a quantity as weather conditions, drainage and compost will permit. Water in the mornings so that all excess moisture will have dried off by eventide. Don't water on dull, cloudy days. Liquid manure will be beneficial to *Cymbidiums, Cypripediums* and to those *Cattleyas* still in growth. Do any repair work necessary to make bushhouses secure for the winter. Go through your plants and attend to any repotting necessary so that the plants can be re-established before the winter sets in.

April: Autumn is now fully established, with the possibility of cold changes and a chance of an early frost. Thought must be given to watering problems. Hasten the growth of all pseudo-bulbs not yet completely developed, but take care to see that plants watered or manured have dried off by nightfall; if the compost is still damp, move them to the warmest and most protected part of your house. Early *Cymbidium* flower spikes should now be showing up. Watch out for slugs, grasshoppers, and locusts. See if you have any plants which need repotting before the winter.

May: We are now in the resting or maturing period for most of our Orchids. Nature is never idle, so that the term "resting period" does not mean that our plants are inactive. It means, more accurately, that the plants are consolidating the growths made by them during the growing periods. Chemical changes within the pseudo-bulbs are preparing them for flowering at their appointed season. All that we can do is to see that disease and pests do not hinder Nature's work. In the case of winter and spring flowering Orchids we can help by giving added nutriment when needed. This applies particularly to *Cymbidiums* and *Cypripediums.* Floraphos is now unobtainable, so that cow-dung seeped in water in the proportion of 2lbs. dung to 4 gallons water with 4oz. fowl droppings added, is the best we can do. Let the mixture stand for a fortnight, and then apply after watering. Winter flowering *Cattleyas* are showing bud in the sheath. They need a certain amount of water, but see that this is applied on sunny, clear mornings only. Provide as much light as possible for all plants from now to the end of July. Winter sunlight will help, not injure. Keep maturing plants dry unless signs of withering appear, then water sparingly.

June: In spring the Orchids fancy lightly turns to thoughts of flowers—very human, aren't they? But whether they flower or not, and how well they bloom, depends, not upon springtime conditions, but upon their treatment during the winter months. So it is during the winter, when there seems to be so little to do, that we must devote our greatest care to our plants. Water and light are the main problems. If you water too freely you will be liable to start your plants into growths which will not only not produce flowers, but will also prevent last season's growths from flowering. Therefore you must be sparing with the watering can. On the other hand, if you stint the water too much, your plant stems will shrivel and deteriorate, thus aborting their flowering period, or reducing the quality and quantity of blooms produced. No arbitrary rule can be given to guide you. You must judge for yourself when to apply water, and how much to give. If a dry wind blows you will be safe in soaking your plants in the early morning. If the weather is gloomy, dont' water. Examine the compost frequently. If this is dry to the touch, water; if damp, don't. Keep the leaves of your plants free from dust and scale. Let all the light possible reach them. Beware of frosts and sudden changes in temperature. Keep an eye lifted for slugs and grubs.

A Composite Index

● Index to Volumes 3 and 4.—With this number we are issuing loosely the Index to enable subscribers to have bound their parts of these Volumes. Subscribers who do not possess Volumes 3 and 4, and are desirous of procuring them can do so by forwarding the subscription of 12/- to Messrs. Shepherd and Newman Pty. Ltd., Publishers, Yurong St., Sydney.

Random Notes

H. R. COLLEY, *Jamberoo, N.S.W.*

● Herewith are a few random notes (10/11/1941) as regards my experiences with certain Orchids, which I thought might be of some slight interest to readers. I have been growing Orchids in a small way for a number of years, making a start with good old *Cypripedium insigne*, which is still going strong and never fails to bloom every year, last winter providing a feast of about fourteen fine blooms. Only quite recently my Orchids have been housed, as previously the plants were scattered here, there and everywhere; some in the garden and some in a glassed-in corner of a verandah. Finding that my collection was getting out of bounds I built a shelter roughly 18 feet by 8 feet of hardwood, and covered with laths ¾-inch in width and spaced roughly one inch apart. The sides are enclosed up to three feet with fibro at one end, and about six feet in length is covered with "Window-Lite" more as a means of protection against wind than anything else.

About two years ago I decided to experiment with the *Cattleya* tribe, and it is about these that I particularly wish to write. I started with some of the species, first and foremost being *Harrisonæ* var. *Loddigesii*, which has never failed me, and is now quite a substantial plant in a basket. This year it put up two spikes of fine bloom, and is now making vigorous growth. Other species I have are *labiata*, five leads and now showing two new leads, and has flowered once; *C. Trianae*, with five leads in a pot, has not yet flowered, but the same variety, in a basket with eight leads, had two fine spikes of flowers this year. *C. Gaskelliana* does well as far as growth goes, but it has not flowered yet. *C. Skinnerii* has proved a disappoitnment. It is growing in a basket!

I have had distinct success with *Brassocattleyas*. I have *Clintonville*, a fine plant, in a basket, which flowers regularly. *Cluny*, another good doer, also *Agnes McGunn*, and in flower at the present time is a fine plant of *Massangeana* x *Hardyana*, with two magnificent blooms and several strong leads.

I might mention that my house faces east and is well protected from the west, from whence come our strongest winds. Frosts, although at times fairly severe, never cause trouble, and I venture to think that my experience goes to show that *Cattleyas* can be successfully grown and flowered without glass. Disease I have never yet been troubled with, I am glad to say. In the same house I have various Dendrobiums, and at the present time I have a fine plant of *infundibulum*, with 24 good blooms out. Another good doer with me is *Zygopetalum*, and also various members of the *Oncidium* tribe. Of *Vandas* I have in bloom at present *Vanda suavis* and *tricolor*. Three plants of *V. coerulea* grow vigorously, but so far have not flowered. Another obstinate Orchid I have is *Laelia purpurata*. It grows like a weed—has now eight leads—but refuses to flower. *Cypripediums*, especially the hybrids do exceedingly well. *Cymbidiums* I keep well out of the house until they show flower spikes, then I bring them in for shelter from the wind. I trust the foregoing brief observations may be of some help to Orchid lovers who have no glass.

Contributors to the *Australian Orchid Review* are requested to post their MSS. to the Honorary Editor at least six weeks before the month of issue to ensure prompt publication these uncertain times.

Patriotic Show.—The Exhibition of Orchids staged in the Brisbane City Hall on October 9th, 10th and 11th, was a delightful sight, and we feel sure that no finer display has ever been seen by the public of Brisbane.

The plants were displayed on long tables on the floor of the City Hall, with adiantums, etc., interspersed, giving a dainty array. Around the tables of Orchids there was a fine display of roses and cut flowers, kindly contributed by the National Rose Society, the Queensland Horticultural Society, the Combined Horticultural Council, and the Northgate Horticultural Society. The whole effect was admirably set off with a large quantity of ferns, palms and other pot plants, from the Brisbane Botanic Gardens.

The Committee desires to tender its best thanks to all those who assisted to make such a fine show, and in particular to Mr. Tom Harris, of Coolangatta, who sent such a fine lot of Orchids from the country, and to Mrs. Smolenski, whose valuable help in making and selling sprays of Orchids meant much financial assistance.—Extract from the Queensland Orchid Society's report for November, 1941.

Brief Notes on Some Native Orchids

The present writer recently described a new species of *Dendrobium* in the *North Queensland Naturalist*, under the name *D. Wilkianum*. It is not a very showy Orchid, but quite interesting to those who do not confine their studies of the family to the more flamboyant members. The plant is rather like a giant *D. aemulum*, but the flowers are entirely different. Their nearest affinity is probably with Fitzgerald's *D. fuscum*, which is also a North Queensland species. They are about the same colour as those of the familiar *D. undulatum*, but the segments are not twisted or undulate as in that species. The labellum is very distinctive, yellowish with very dark veins. *D. Wilkianum* hails from Babinda, where it was discovered by Mr. J. F. Wilkie.

VANDA TERES *Ldl.*
Grown and photographed by P. A. Gilbert.

Last November I had the pleasure of a week's pilgrimage at Mount Irvine, where, under the capable guidance of Misses J. and G. Scrivener, of "Taihoa," the Orchid treasuries of that area were investigated. The drought was palpably in evidence, but even so we did very well. Two of the most interesting "finds" were Mueller's *Prasophyllum Woollsii* and Fitzgerald's remarkable *Thelymitra circumsepta*, neither of which have appeared in botanical records for many years. A report on the former has been published in the *Victorian Naturalist* for January, 1942. It is one of the numerous "pygmy" Prasophylls, which have their greatest development in New South Wales, and is illustrated by Fitzgerald in *Australian Orchids* II, 4. The Mount Irvine plant is darker than Fitzgerald's (which was a lowland form), and also more profusely ciliate; it is probably closer to Mueller's type, which was discovered in the Blue Mountains in the '60's of last century. *Thelymitra circumsepta* is unique in the genus of "Sun Orchids," in that it possesses not only the pair of hair-tufted column-lobes which are so characteristic of the chief section of *Thelymitra*, but a *third* tufted lobe right in front of the column, which must effectively bar all insect explorers. Hence, as we should expect, the species is self-fertilising. It is illustrated in *Australian Orchids*, I.4. Another item in the "bag" was Brown's *Prasophyllum australe*, a tall plant found in swampy places. It is one of the mose attractive members of this genus; the flowers are brown, green and white, very sweetly perfumed. *Caleana major* and *minor* were very much in evidence, and fine flowering specimens of *Cryptostylis erecta* and *subulata* were taken; *C. leptochila* was also there, but seemed to feel the drought more than its congeners. Two forms of *Cymbidium suave* were found; one very pale green, the other almost old-gold—H.M.R.R.

"Saying it with Orchids"

J. MURRAY COX, *Brisbane, Q.*

Continued from December, 1941, issue.

● The man gabbled more rapidly than ever and soon outdistanced Ethelbert's university knowledge of German, then, using his last puff of breath, blew a sharp blast from a whistle slung by a lanyard from his shoulder.

Half a dozen armed sailors, accompanied by some sort of petty officer, rushed on to the pontoon. They stared at Ethelbert in amazement. The petty officer gabbled vigorously and gutturally.

"I am an Australian," said Mr. Smithers, proudly. "I have come to discuss matters with Herr Hitler. Please tell him I'm here."

The petty officer gasped, and then fired off a splurge of speech which left Ethelbert quite cold. At this moment a newcomer in lieutenant's uniform appeared. The p.o. let go another round or so of quick fire at his superior, whose expression changed from aloof dignity to utter bewilderment.

"I don't understand," he said in slow but quite good English, turning towards Ethelbert. "Who are you?"

"I am an Australian," repeated Ethelbert. "And I have come here to discuss with Herr Hitler certain matters arising out of the state of War now existing between your country and mine."

"Yes—yes," stammered the officer, "but how did you get here?"

"I sailed here," said Ethelbert, simply.

"You-sailed—here?" the words came like the last painful gouts from a beer barrel. "But how did you get through our patrols, and the damned English patrols, and the mine field and all?"

"I didn't see any of them, and presumably they didn't see me. Anyway I'm here, and now I want to see this Hitler chap that's caused all this fuss and bother. I've got to get things straightened out."

"Are you Mr. Menzies?" asked the officer, dazedly.

"Menzies? Menzies? Oh, that's the politician fellow. No, of course I'm not. I'm Ethelbert Smithers." He drew himself up to his full height of five feet two and a bit.

"Mr. Smithers. I don't know who or what you are, but you are a very brave man. Naturally I must put you under arrest as an enemy subject, and I am not sure that you won't be shot as a spy. But I shall communicate with my Commanding Officer and he may arrange for you to see der Herr Fuhrer. But what is in that queer glassed enclosure on your yacht?

"Orchids," said Mr. Smithers.

"Gott in Himmel," said the officer, relapsing into his native tongue.

* * *

The armoured car drew up at a large building whose outline was hazy in the cloud-muffled moonlight, being protected by a thick wall of sand bags. Four men armed with rifle and bayonet alighted from the front compartment, and stood to attention at the rear door.

"Will you kindly alight, Mr. Smithers," requested the officer whose name, our hero had learned, was the almost incredible one of Felix Von Schlieper-Spittenhausen.

Ethelbert alighted and with the guards in front and the Lieutenant behind him, entered the building. They were whirled upwards to the seventh floor. Down a long passage with armed men stationed every few feet, they marched, the guard and the Lieutenant doing the goosestep. This was rather inconvenient for Ethelbert, for he was unable to fit his stride or his tempo to that of the guard, and his pride forbade him to adopt their peculiar method of progression.

Consequently it frequently happened that when Von Schlieper-Spittenhausen's boot was projected forward it contacted with the roundest part of Smither's person, and thus spurred his dignified trot into a canter. On such occasions the leading pair of guards, thinking he was trying to break away, swung their rifles across to bar his path, causing him to bump himself uncomfortably. He turned to the officer and uttered a protest. "Hush!" whispered that young man, "it is verboten to speak in the corridor. It disturbs der Herr Fuhrer's meditations. Proceed."

At last they halted at a steel door, round which was a ring of armed men. The Lieutenant spoke to the officer in charge, who, in turn, spoke through a wall telephone beside the door. After a minute or so the heavy door opened and the little party passed through. Smithers found himself in a shorter hall, whose steel walls were pierced every little way with apertures, from which protruded the muzzles of machine-guns.

(*To be continued*)

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AUSTRALIAN ORCHID REVIEW

Volume 7 **June, 1942** No. 2

The author of each article is responsible for the facts and opinions expressed therein

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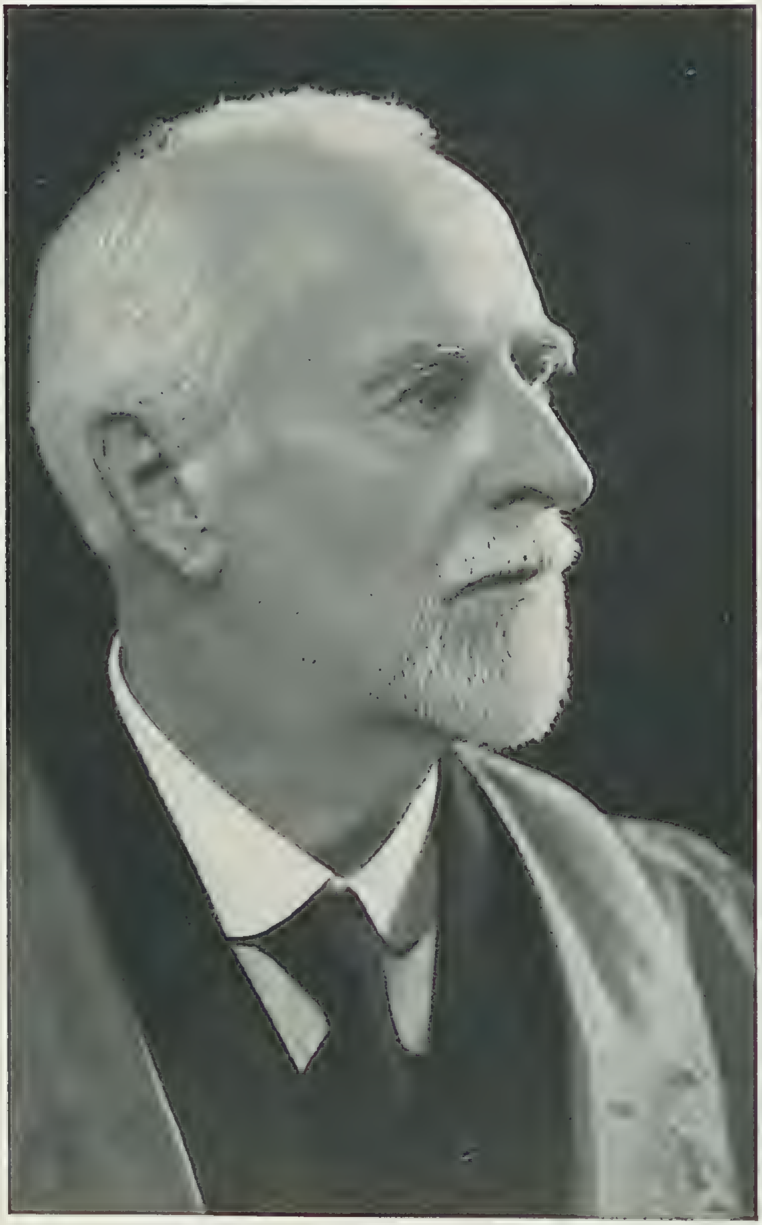


Dr. R. S. ROGERS, M.A., M.D., D.Sc.
Passed away 28th March, 1942.

In Memoriam: **Richard Sanders Rogers,** M.A., M.D., D.Sc.

1862—1942

Rev. H. M. R. RUPP, *Northbridge, N.S.W.*

● By the death of Dr. R. S. Rogers in Adelaide on March 28 last, Australia lost a distinguished citizen and a man of rare qualities, who was also the most outstanding orchidologist of the southern hemisphere.

Richard Sanders Rogers was born in Adelaide in 1862. At the time of his death he was the senior graduate in South Australia of Adelaide University. He graduated B.A. in 1883, and M.A. in 1897. After obtaining the former degree he went to Edinburgh on a scholarship, and in the following year was gold medallist in zoology at Edinburgh University. In 1887 he took the degrees of Bachelor of Medicine and Master of Surgery there. In 1896 he returned to his native city to practise his profession, proceeding to the degree of Doctor of Medicine at his old Alma Mater. He soon made his mark in South Australian medical circles, and after achieving a Fellowship of the Royal College of Surgeons, he became a consulting physician to the Adelaide Hospital, and Lecturer in Forensic Medicine at the University. For some years he was deputy-chairman of the Hospital Board. Being a man of wide culture, his services were soon in demand in other spheres of civic activity. He was appointed President of the Board of Governors of the Public Library, Museum, and Art Gallery of South Australia; and occupied the Presidential chair of the Justices' Association, and of the Royal Society of South Australia. He served in South Africa in the Boer War; and in the Great War of 1914-1918 he ranked as Lieutenant-Colonel, commanding the Keswick Base Hospital from 1914 to 1919. After returning to Adelaide he was made Superintendent of the Enfield Receiving House, and visiting Superintendent of Northfield Mental Hospital. He was elected a Fellow of the Linnean Society of London.

In 1932, Dr. Rogers visited Sydney as President of the Botany Section at the meeting of the Australian and New Zealand Association for the Advancement of Science. His presidential address on that occasion was entitled, "Some Developments in Orchidology." It was a masterly resume of research work during the past century in the following fields of Orchid study: (1) Systematic and Phyto-geographical, (2) Mycorrhiza, (3) Pollination; applied particularly to "work done in such territories as directly or indirectly claim the sympathetic interest of this Association." The address received warm praise from far beyond the bounds of Australia; and it served as the thesis for which in 1936, when he was 74 years of age, Adelaide University bestowed upon him the degree of Doctor of Science.

Outside his professional and civic activities, Dr. Rogers found wide scope for his personal inclinations in botanical studies and research work. It was not long before he began to concentrate on that great family of flowering plants with which the readers of this Review are most concerned—the *Orchidaceae.* Soon he became recognised as the leading authority on Australian Orchids; but his interest extended beyond the bounds of State and Commonwealth. It is perhaps a matter of regret that he was not induced to undertake a comprehensive Handbook on our native Orchids. But he never permitted his love of the subject to interfere with the duties of his profession, or those which he had undertaken in other departments of good citizenship. Yet he wrote a great deal. "An Introduction to the Study of South Australian Orchids" is a charming little book, with its illustrated supplement recording the botanical prowess of Robert Brown, Ralph Tate, and Robert David Fitzgerald. He contributed the Orchid Section to J. M. Black's "Flora of South Australia," and the comprehensive article on Orchids to the Australian Encyclopaedia. The "Transactions" of the Royal Societies of South Australia, West Australia, Victoria, and Queensland (but especially the first-named), as well as the "Victorian Naturalist" and other journals, bear many proofs of his indefatigable industry in the description of new species and the clearing up of obscurities in connection with old ones. He described upwards of 66 new species for Australia; at least 13 for Papua; and 3 for New Zealand. Only a very small number of these have been or are likely to be, challenged. He established three new genera: *Rhizanthella* and *Goadbyella* in West Australia, and *Petalochilus* in New Zealand. All these figures are conservative, for there are no doubt publications of his which from various causes have not come into my hands. When he was President of the South Australian Royal Society he compiled a most valuable history of the Society itself, delivering this as his presidential address.

But no tribute to his memory could be worth the name which failed to pay tribute to the man himself. It has been my very great privilege to possess his personal friendship for close on twenty years. Though we never actually met until his visit to Sydney in 1932, we had long been in correspondence; and only those who have been recipients of his letters can appreciate what a joy they were to the seeker after knowledge. When I realised what pains he took to give some genuine satisfaction to every enquiry, I sometimes felt ashamed of troubling so busy a man with my little perplexities in Orchid lore; but as he always expressed his pleasure in my letters, I fear I went on my way unrepentant. His breadth of mind and wide culture, tinctured with a quiet but delicious sense of humour, made his letters all the more charming. I had written for his opinion about the nomenclature of a North Queensland Orchid which had already had three names in the course of 50 years, all ultimately proving invalid. "Being a parson," he replied, "it is very obviously *your* duty to provide the poor child with a new name." And he was generous beyond measure; not only in often urging his friends to write up some Orchid matter which (as the information he supplied proved) he could have done far better himself; but in unobtrusive gifts of books, plates, photographs, and instruments which he thought would be helpful. I have recorded elsewhere how he sent me a complete translation, in his own handwriting, of J. J. Smith's treatment of *Sarcanthus*, and allied genera, from the Dutch original, on 37 pages of a note-book inscribed, "To my friend, from R.S.R."

It had been obvious to his friends for some time past that "the dear Doctor" was beginning at last to feel the burden of increasing age. Letters grew shorter and less frequent; and then they ceased to come. When he passed his eightieth milestone, one feels that he could not have wished to linger long, conscious that he could not now actively participate in his life-long interests. But our hearts go out in sympathy to the wife, son and daughter bereft of his company. Mrs. Rogers was closely associated with her husband's botanical activities. On all the labels of the many South and Western Australian Orchid specimens in my herbarium which came from the Hutt Street home in Adelaide, there is invariably the inscription, "Collected by Dr. and Mrs. R. S. Rogers." Happy comradeship! to be renewed, we hope, over wider and greater fields of exploration

"from out our bourne of Time and Place."

In Memory of a Gentleman

THE LATE MILES ROSS FOX

J. MURRAY COX, *Brisbane, Q.*

● With a world bowed beneath the tumult of war with its wastefulness and brutality and loathsomeness, and its wanton destruction of human lives, the passing of a man seems of little moment. The beating of the wings of the Angel of Death is about us at all times, and hardly a day passes but we hear of the passing on of one we knew or loved.

Nevertheless, the news of the sudden death of Miles Ross Fox came as a shock to the members of the Queensland Orchid Society; and we, who knew him intimately, who had shared with him the delights and anxieties associated with the early days of the Society, felt that some part of us had died with him.

Born at sea 58 years ago, the late gentleman was the son of Clemment Leman Fox, sometime inspector of schools in Queensland. He was a well-known business man, being the managing director of the Queensland Fruitgrowers Society Ltd., and a director of A.C.F. & Shirleys Fertilizers, Ltd.

MILES R. FOX Passed away 10th March, 1942.
Past President, Queenesland Orchid Society.

He was a keen and successful Orchid cultivator, and devoted all his leisure hours to the care of his collection. His plants were a delight to the eye, for they were models of neatness and cleanliness. He was the pioneer of the electrically heated glass-house in Queensland.

Miles was one of the little circle of enthusiasts who formed the nucleus of the Society of which he was President in 1936 and 1937. As a committee-man and in its highest office he contributed greatly towards the success of the Society.

He is survived by his widow, Mrs. Ellen Margaret Fox, three daughters, Barbara, Margaret (Mrs. R. Grant), and Marjory, and two sons, Ian (R.A.A.F.), and Clement.

It is not as an Orchid grower, nor as a business man that we who knew him best will remember Miles Fox. There was a charm which seemed to radiate from him and inspired in all who came in contact with him the certitude that they were in the presence of a gentleman, in the truest and noblest meaning of that oft-abused word. Kindly and considerate, tolerant of the weaknesses of others, and with an ever-ready smile, he helped to spread a warmth of friendliness which cheered the dejected and encouraged the hopeless.

We shall miss our old friend with his shy, quiet ways, but will always feel that we are the better for having known him. The stress and trials of the day may give us little chance to think often of him, but I think Miles will not mind that. Christina Rosetti's words come to my mind as I write:—

> If you should forget me for a while
> And afterwards remember, do not grieve;
> For if the darkness and corruption leave
> A vestige of the thoughts that I once had,
> Better by far you should forget and smile
> Than that you should remember and be sad.

And that is typical of Miles Ross Fox.

Sir Jeremiah Colman, Bart.

A Life Spent in Public Service

Funeral at Gatton, England, January 23rd, 1942

NURSE F. BURT, *Coogee, N.S.W.*

● The Parish of Gatton, where he had resided for 50 years, for which he had a deep and abiding affection, was plunged into mourning on Friday, when the death of Sir Jeremiah Colman, Bt., D.L., J.P., took place at Gatton Park. In the Borough of Reigate, where Sir Jeremiah had always taken a warm personal interest, and to which he had made many munificent gifts, residents heard the sad news with profound regret.

In the city of London, where he held many important offices and rendered distinguished service in official and public circles his passing was also sincerely mourned.

Sir Jeremiah, who had been in failing health for some months, was 82 years of age. He acquired "Gatton Park" from Lord Oxenbridge in 1888, the purchase price being £82,000. He was a High Sheriff of Surrey as long ago as 1893, a Deputy-Lieutenant of Surrey, and one of His Majesty's Lieutenants for the City of London. He was Chairman of the Old Reigate County Bench for 26 years, and retired in 1928. He had a passionate love for "Gatton Park." Generations of families have worked on the Gatton Park estate. With Lady Colman he took the kindliest interest in their personal welfare, and won and retained their affection and regard. "Gatton" is a parish of mourning.

Foremost amongst many other notable events were the lavish firework displays for which Gatton was noted. These celebrated family and national events drew vast concourses from far and near.

Sir Jeremiah Colman was the eldest son of the late Jeremiah Colman, of Carshalton Park. In 1883 he entered the firm of J. and J. Colman, mustard manufacturers of Norwich. Several thousands were employed. Sir Jeremiah was later taken into partnership, and in 1900 he became Chairman. Like his father, he devoted his life to this undertaking, and later joined up with Reckitts. Although latterly he no longer took the same active part in the management, he was not allowed to surrender the Chairmanship, to which he was first appointed 40 years ago.

There are few organisations in which he was not in one way or another connected with in Reigate. The Colman Institute, Redhill, cost £8,000, and in 1914 he presented the Borough with 18 acres of land on Reigate Hill, which preserves for all time one of the choicest spots in Surrey.

Cricket was one of Sir Jeremiah's greatest interests. He was a member of M.C.C., the oldest member, and Past President of the Surrey County Cricket Club, and was believed to be the oldest members of the Incognito C.C. He had the unique experience of having seen and met every overseas team visiting England since the aborigines arrived in 1868, and he was the last survivor of those attending the banquet given to the first Australian cricket team.

The funeral took place at Gatton, the coffin being draped with a Union Jack, and covered with wreaths of magnificent Orchids.

His service to his country was recognised when he was created a baronet in 1907. In recognition of those he rendered to horticulture, the King of the Belgians conferred on him the high honour of Chevalier of the Order of Leopold. He received in England the Victorian Medal in Horticulture.

Gatton Orchids are world-famed. He wrote a book on "Hybridization of Orchids." On the occasion of his golden wedding he gave away gifts amounting to £16,525. He was a great Christian gentleman. In truth, may we think of his death as the coronation of his life. A memorial service was held in London also.

Australian Orchid Review

Editorial

Judging Cymbidium Flowers

● In the March issue of this Review (Vol. 7, No. 1) "H.W." refers to the flower judging at a commercial Orchid Show last October (1941), and asks, "Are we not getting away from the typical *Cymbidium* shape when we encourage the straightening out of all the petals"? If we take the word *typical* to mean "forming or serving as a type; constituting a type, etc.," the ground is cleared for a discussion on the subject.

The type *Cymbidium* is probably *pendulum,* described by Swartz in 1800, the flower being described as "1½-2 inches in diameter; sepals and petals narrowly oblong, acute, recurved at tips; the petals somewhat shorter and more acute than the sepals", (Veitch). From the horticultural point of view this description does not read enticingly. *Insigne, eburneum, Lowianum,* and others used extensively in hybridization were described many years later. If *pendulum* had been adhered to as the *typical Cymbidium,* the present horticultural varieties would not be in existence. Some of the present day hybrids measure 5 inches or more across.

The "type" hybrid *Cymbidium* is *eburneo-Lowianum* which appeared in 1889, and although this is, and has been, a very useful hybrid, most horticulturists prefer a larger, rounder, and more colourful flower. The aim of the hybridist throughout horticulture is to create larger, more colourful, and shapely flowers, selecting other unexpected characters which hybridization may produce. Utility is the dominating factor, and is carried out regardless of the original specific qualities.

The hybridist sets the fashion, the amateur horticulturist tacitly accepting his ideals and inclinations. There is no cut and dried *Cymbidium* standard for size, shape, and colour. Probably the fashion of to-day for round, open, well-balanced flowers will be superceded by more vividly coloured kinds to-morrow, with less symmetry, perhaps. Bright colours and symmetry in *Cymbidium* perianths—sepals and petals taken together—are achievements for the future.

As a little misunderstanding and criticism of the judging of flowers has taken place in regard to the Shows organised by an enterprising nurseryman, it may be as well to further discuss a few points to clear away any disagreements. The great popularity of *Cymbidiums* induced him to offer competitive prizes to still further encourage the cultivation of these interesting kinds. Points were allotted for colour (30), shape (30), size (25), culture (15). The judges were asked to apportion the points arbitrarily. The question of colour caused some variance of opinion among the judges, and rightly so, for it is a very difficult matter for anyone to describe a colour without recourse to a colour chart.

Many of our Orchids are described, especially *Cattleyas,* as being mauve, whereas they are usually Orchid purple in tints and shades. Orchid purple is a standardised colour of the Royal Horticultural Society. The preference for one colour over another is one of personal fancy, and before any set rules can be established for judging Orchid flowers, a decision will have to be arrived at as to the allocation of points for colour, and its various tints and shades. It requires a stretch of the imagination to say that varieties of C. *"Swallow"* are rich in colour, the majority of the best shaped flowers having a very faint tint of Orchid purple in the perianth. Some petals are whitish or white. A *Cymbidium x Swallow* with a full hue of Orchid purple in the perianth is an ideal for the future.

A deficiency in *Cymbidiums* which detracts from their appearance is the tendency of the labellum or lip to curl back to a half circle, showing the proximal portion only. The labellum should be prominent, that is to say, it must be visible in its entirety.

Points for culture were allotted to plants on the appearance and condition of the pseudobulbs in relation to the number of spikes of flowers which the plants bore. A plant with six pseudobulbs and one spike of flowers did not receive the same number of points as a plant with six pseudobulbs and three spikes of flowers, other conditions being equal. Alloting points for culture in conjunction with the flower itself would enable an inferior flower to beat a better one.

Cool House Culture and Notes for Amateurs

T. H. JAMES, *Hazelbrook, N.S.W.*

● Another summer has passed. How quietly the seasons arrive! And before their advent has been fully realised they have merged into the next. In accordance with the general make up of a gardener whose optimism seems never to be quite submerged, we review our achievements and where there are failures, even if serious, we solace ourselves with the hope, or rather the fixed belief, that next season will show a much more promising result. This optimism is a wonderful asset, and prevents our tribulations from completely damping our ardour for our plants.

Those living in the districts served by the Sydney water supply have had the greatest possible tribulation, the edict against the use of water for any but domestic purposes. How many manage to maintain their Orchids is best known to themselves. I have heard that a few have become so discouraged that they have sacrificed their collections, but I find it hard to believe.

I have left my Sydney suburban home and am now living on the Blue Mountains at an elevation of 2,300 feet. The change from a place on the Sydney Harbour front to one high up on the mountains is considerable, and the effect on the Orchids will be a matter for the future. I am afraid it will be necessary to provide some heat during the winter, much as I dislike the idea. My plants have been accustomed to, and flourished in a winter temperature which was mainly in the mid or early forties of F, with occasional drops to frost level. On the mountains, however, the general winter temperature level is lower, and the season longer. Whilst heat will be provided, at no time will the temperature be allowed to exceed 50 degrees F., and it will probably be frequently some degrees lower. Whilst, therefore, I shall have a heated house, I think I might still be considered a cool-house grower. At any rate, whatever notes I may contribute to this Review would be based on my experiences as such.

Ventilation.—Although the winter months are now here, do not completely seal up your house. Remember that in Nature, plant life is accustomed to lower temperatures at night than during the day. Some heated houses I know of are warmer during night than day. This is quite wrong. Air is absolutely essential for healthy Orchids, and in a stuffy atmosphere they cannot for long maintain a healthy condition. Ventilators on the western or southern side of the house could be closed, those on the other sides should be partly open.

Glass-houses.—I have built a new glass-house at my new home which is distinctly unorthodox. The sides are completely glass to within six inches of the ground. That bottom six inches is covered with gauze and hinged ventilators. On hot summer days all could be opened, and, according to the weather, one or more closed. Metal glazing bars carry the roof glass, and top ventilation is provided for by a space between the top of the glass and the ridge board. In winter the opening would be reduced. This has always been my ideal, which gives a maximum of light and air for the Orchids, and all the various foliage plants which, I believe, make the glass-house not only attractive, but a much happier habitat for the Orchids. The most enthusiastic must admit that a house with nothing but Orchids is not particularly attractive when they are not in flower and, even then, how much better a *Cattleya* looks among ferns or other foliage. The atmosphere of such a house is, I consider, an important factor in successful Orchid growing. I have mentioned this before, and I repeat it because of my belief in it. In opposition to this idea the successful culture of commercial houses in England and America might be cited. Quite so, but I still incline to the opinion that the provision of natural conditions must be beneficial apart from the aesthetic effect.

Light.—During the winter months all paint or other covering could be removed from roof glass with advantage. The direct rays of the sun improve the quality of flowers and the health of the plants. In the bush-house increase the light if at all possible by removing alternate laths or some of the covering whatever it may consist of.

Cattleyas.—In previous notes I mentioned the luxurious growth and large number of new leads that had developed on many of my plants. One result which I did not anticipate, but certainly should have done so, is that the multiplicity of new growths quickly resulted in the pots or baskets becoming seriously overcrowded.

The effect has been a reduction in the number of flowers to the bulb. Whilst in some cases up to four bulbs flowered, in most cases only one flower to each bulb was produced instead of three or four as expected, so a considerable amount of repotting is ahead. On account of the variable habits of *Cattleyas*, repotting is not a regular, definite time job, but can be undertaken any time that will not interfere much with root action, but it should not be done in cool-houses during the winter, as the absence of root action might cause a set-back. Give just sufficient water to prevent the bulbs shrivelling, this, of course, being a matter for individual determination in accordance with glass-house conditions. Some *Cattleyas* have a habit of producing sheaths but buds do not develop until spring. Water should be kept from these sheaths as they become dry and porous. Water may penetrate and rot dormant buds.

Cypripediums.—These are now in full flower. Judging by the varieties imported during the last few years many excellent types should be seen this year. Water just sufficiently to keep plants moist is all that should be required, but where tan bark is used, watering at least twice a week I find necessary. Do not be misled by surface dampness as that frequently cloaks a dry interior. That result often follows light watering. After flowering has finished and a short period of rest, any repotting necessary should be done. With tan bark, of which I am still a keen advocate, larger pots seem to give better results than those usually used with other composts. My own plants, with a few exceptions, have grown particularly well and are flowering freely.

Cymbidiums.—The water restrictions in the Sydney area, and the necessity of many growers to provide shade in order to save the plants, have proved to my satisfaction my old contention that successful flowering will only result when the plants are given abundance of light. In my own particular case, the pots were let into the ground and given heavy shading as I could water only once every two weeks. That shading was during the critical months of January and February. Result—not more than 20 per cent. of plants are flowering, although growth is good. This aspect was discussed at a recent meeting of The Orchid Society of New South Wales, and members generally agreed with that contention. One member who has a very large collection has many growing in a very sunny position and others in the shade. The former are flowering almost without exception, whereas the latter have produced only an occasional spike. I have found that, provided they receive plenty of water during the hot weather, the foliage will not burn even in full sunlight, unless exposed to hot winds. Several growers believe that light is more important than compost.

When flower spikes have been definitely identified, a moderate amount of water should be given, and occasional doses of liquid manure up to time of bud opening. An interesting aspect of the *Cymbidium* disease often discussed in these columns recently came under my notice. From a diseased plant about half was removed from the pot, soil as well. Fresh compost was used to replace that removed. The new growth on the side with the new compost is clean and vigorous, whereas those on the other side are stunted and badly affected. The grower, therefore, inferred that the trouble was due to faulty compost. It would be interesting to learn the condition of that plant in twelve months time.

Dendrobiums.—Many of these are now producing their flower buds, and all should be kept moderately damp. Give as much light as possible.

Oncidiums.—One of the most delightful of Orchids is *Oncidium varicosum Rogersii.* It is easy to grow in a cool glass-house or bush-house in pure fibre, or on a fibre block. My plant now has a stiff erect stem carrying over 70 brilliant yellow flowers about the size of a two-shilling piece. It should produce 4 spikes next year. A particularly attractive feature is that all buds open together. Many *Oncidiums* have the habit of opening one bud or a few buds at a time, with a disappointing result. I have heard much about *Oncidium papilio*, and although it will grow in a cool glass-house, I would not advise its acquisition. It produces a single flower at a time on a very long stem. From my experience *Oncidiums* should not be allowed to get really dry at the roots, and unless they have compost to enter or something to cling to, will die.

Thunias will shortly drop their leaves. Turn the pots on their sides in a cool place—not in a dry shed or cellar—until spring.

Ceologyne cristata.—Buds are now showing. Never allow it to become dry, as shrivelled bulbs take a very long time to recover. I would suggest that when flower spikes are about two inches long, the plant should be moved to under cover for protection, and as an inducement to lengthen the spikes. Out in the open they are apt to be on the short side and less graceful.

Miltonias.—The hybrids of the cluster bulb type have been a complete failure with me, but the species with a creeping rhizome grow luxuriously, particularly on a block of fibre. Vide reference to *Miltonia spectabile*, in March notes. A few Sydney growers have had some success with the cluster bulb hybrids, so I intend to try again. One particularly successful grower advises that small pots with at least two-thirds of it drainage are essential. The compost used is mainly fibre with a little each of moss, sandstone, and leaf mould. Grow them in cool conditions and never allow them to become dry. With this compost they could never be really wet.

Phaius should now be showing their flower spikes and would benefit from occasional applications of liquid manure. My plants are grown outside in full sunshine, and are left there until flower spikes are well advanced in order to restrict somewhat the height of the spikes. In their new home I have had to bring them into the glass-house as frosts have already appeared. *Phaius Wallichii* is, in my opinion, the best of the species.

I hear, every now and then, of growers who are having a fair measure of success with *Cattleyas,* without artificial heat during winter. I was, therefore, particularly interested in Mr. Colley's notes, in the March Review of this year, in which he describes his success with *Cattleyas* grown in a bush-house at Jamberoo. I am not sure of the elavation of that town, but it is well above sea level and some distance inland, south of Sydney, and is subject to frosts. Another blow to orthodoxy.

● At the November (1941) meeting the honorary secretary, Mr. T. H. James showed three Cattleya plants as evidence of luxuriant growth under cool-house conditions. The three plants, which are typical, were obtained about six years ago and then consisted of four or five bulbs with one lead. To-day they are producing 11 to 13 new growths. Some of these were the result of division earlier, but many this year appear to be due to some other factor, as the number of new growths is practically double that of last year. They have flowered regularly for the past four years, a spray on one of them last year had four flowers. One of the plants flowered twice last year on two leads, producing 10 flowers in all. They are in the baskets in which planted originally, and have not been re-potted. They will not be disturbed in any way. As the bulbs reach the edges, the baskets are built out with fibre. The only difference in treatment last summer was watering at night instead of in the morning. In his house watering in the morning on hot days resulted in the plants being damp for about six hours and dry for 18. Now they are damp all the time.

● At the January meeting of the Orchid Society of N.S.W. the general question of manuring of epiphytes was discussed at considerable length. Dr. Vote considered that if given good cultural conditions the application of manures should not be necessary. Also that the compost in due course breaks down and provides nutriment, and possibly in that state contains more food properties than new compost. As opposed to that it was suggested that in nature epiphytes live on the trees and rocks. Their roots cling to the rocks and tree trunks and penetrate cracks and corrugations. They are exposed to the air and absorb chemicals in the copious rains. Dust, decomposing stone, and vegetation also supply a continuous supply of nutriment. In cultivation, the plants are under cover and the roots confined in pots and baskets thus being deprived of the small but continuous renewal of nutriment. Mr. Walters remarked that worms regenerate soils, and, in some countries, are bred for that purpose. They might be useful in Orchid composts. Quite so, but worms in pots usually clog the drainage and thus offset any material benefit. Mr. Newman told of Orchids grown successfully in pebbles and treated with nutrient solution. He added that the iron found in solution in water from long standing pipes would settle if water was allowed to stand for a time. —T.H.J., 19/2/1942.

● Exhibits at the March meeting of the Orchid Society of New South Wales were an attractive lot. *Cattleya labiata x C. Princess Royal* (M. Reynolds); *Cymbidium erythrostylum* (H. J. R. Overall); *Miltonia x Gattonense, Odontoglossom grande,* a fine exhibit, *Vanda Kimballiana* (Dr. J. A. Vote); *Vanda coerulea* (A. Coleman); *Cypripedium x Grace Darling, Cyp. Hoodmead* (W. Fahey).

● "I must congratulate you on the excellent way in which you are keeping up the standard of the "Australian Orchid Review" in spite of the present war situation. I look forward to each issue, and all other reading is laid aside until I have studied the 'Review."—D. N. H. Sherwood, Queensland, 12/4/42.

● Subscriptions for the Australian Orchid Review are now due. Please post your remittance of 6/- (six shillings) to Australian Orchid Review, c/- Shepherd and Newman Pty. Ltd., Yurong Street, Sydney, N.S.W.

Amateur Propagation

Miss A. HARRIS, *Bellevue Hill, N.S.W.*

● Some time ago, about one-and-a-half years, I bought a small plant of *Dendrobium nobile* from one of our big stores, who had them as "a special" for 2/6 each. For a long time this little plant made no progress whatever, the leaves fell off, and one of the pseudobulbs broke off at the base. It seemed a shame to just throw the bulb away as it looked quite green, so I re-potted the whole plant in some crocks, a few pieces of charcoal with some fibre, and topped it off with spagnum moss. Then I pushed the bulb which had broken off the main plant through the mixture deep into the pot. After some time I noticed a very small green knob appear somewhere about the middle of the long bulb, and this has gradually grown into a very lovely little shoot, and roots are now making their way through the air down into the pot. Now, I suppose you Orchid growers will say, "fancy making such a fuss about that, what did she expect it to do?" But to me that is a very wonderful thing. I have never grown anything like that before and that little *nobile* is the pride of my heart. It has grown from a very weedy looking little plant into a beautiful, shiny, green-leaved, sturdy Orchid, and although I suppose I had not very much to do with it I like to think I had.

Again, some two years back I bought a *Cymbidium* seedling, an El Dorado, from an estate, and this plant had quite a few back bulbs in the pot. After a little while a shoot squeezed its way through the middle of the pseudobulbs and it appeared to me that these pseudobulbs seemed to be impeding the progress of the plant, so I twisted two of them out with some amount of apprehension not knowing exactly whether I was doing the right thing by my El Dorado. But now my back pseudobulbs are shooting. I placed them on some peat-moss and kept the peat-moss moist for weeks on end. They seemed just to stay the same, not making any progress nor withering away. I thought I would then try potting them, and made up a mixture of soil from the garden, with rather sandy soil, some old oak leaves (from a tree I grew myself from an acorn many years ago) and a little manure topping it off again with peat-moss to keep moisture inside. I pushed the base of the pseudobulbs just underneath. Now one of the pseudobulbs has a shoot about threequarters of an inch long, and the other is just showing the tiniest shoot. I am proud of my first attempt at reproducing from my own plants. It is quite the most wonderful thing that has happened with my plants since I first began to get my little collection together.

DENDROBIUM X OWENIANUM
(*D. Linawianum x D. Wardianum*)
Grown and photographed by P. A. Gilbert.

● In the "Queensland Naturalist" for February 1942, the Rev. H. M. R. Rupp describes and figures a new species of *Saccolabium* from Cairns and Hinchinbrook Island, under the name *S. Tierneyanum*. It is a robust epiphyte with a stem up to 30 cm long, and large leaves. The flowers, however, are small, in racemes shorter than the leaves; green outside and mottled brown inside. The description of this new species is followed by a note on *Dendrobium Carrii* from Mount Spurgeon, which was described in this journal by Rupp and White a few years ago (Q. Nat. x, 2), from a plant with withered flowers. Last year this plant bloomed in Mr. Rupp's bush-house, and an amended description of the flower is given.

Cultural Notes for Brisbane

J. MURRAY COX, *Brisbane, Q.*

● *July.*—This month should be devoted to preparations for the new cycle of growth which will commence with the Spring. Check over your potting material, your pots, stakes, etc. Attend to spraying. Note the plants which will need re-potting when growth commences. Watering is now down to a minimum. Probably one good soaking in tepid water on a fine morning will be sufficient if an occasional over-head spray is given your plants. *Cymbidiums* and *Cypripediums* in bud can be given liquid manure, as also can the *Calanthes* and *Phaius*.

August.—Once growth has commenced it is desirable that it be maintained, as a sudden stoppage to a newly started growth usually means either a blacking-off or a stunted and abortive pseudo-bulb. Care must therefore be given to watering. The plants commencing their growth cycle will require more water than they have been given during the last two months, because it is through the water in their compost that they are able to assimilate their food. On the other hand, a sudden cool change while the compost is wet is liable to be disastrous. Watch the weather reports in the daily press, and water on the mornings of days which are expected to be fine and warm. August is a good month in which to spray your plants with a nicotine wash. Go through your plants and make a list of those that need re-potting.

September.—This month marks the beginning of the annual cycle for many Orchids. Plants which need re-potting should be dealt with as soon as the new growths appear. If, owing to war conditions, you are unable to obtain Osmunda fibre, elkhorn peat and todea fibre will serve as substitutes. Cocoanut fibre has also proved to be quite serviceable. Spray your plants with a nicotine sulphate solution to clear out any scale which may have obtained a hold during the winter period.

The quantity of water and frequency of watering will be gradually increased, but care should be taken to avoid having the plants in a damp condition at nightfall.

October.—Our plants are now getting into their stride for the new growing season. Watering will be increased gradually and on dry, hot nights a spraying of the leaves of plants in glass-houses will help them. Liquid manuring of plants in full growth or forming flower scapes will help to produce stronger growths and better blooms.

Pests begin to prowl again—Orchid beetles are already looking for foliage and flowers to destroy, while the slug is ubiquitous. Watch for scale under the sheaths of *Cattleya* stems. Cockroaches and crickets are also becoming nuisances in Orchid pots. Set baits and traps, and submerge the pots occasionally.

November.—We are now approaching the peak period of the annual growth cycle. Copious watering is now necessary, particularly on dry, hot days. Under such conditions, I find it well to water thoroughly early in the morning; then, if possible, spray the benches and floors about 11 a.m. and again at about 8 p.m. When the weather is hot but humid, less water is required.

Weekly applications of liquid cow manure will help to make strong, healthy growths. I have found an occasional application of a food comprised of 1 teaspoonful of nitrate of soda and 1 teaspoonful of nitrate of potash dissolved in 4 gallons of water to be beneficial. Recently, someone told me that he had found an occasional application of crude castor oil to give good results in growing Orchids. I have not experimented with this.

Attention to lighting is desirable — your plants will require the maximum time amount of light, but care should be taken to avoid sunburn through glass. Slugs and Orchid beetles are plentiful, while the scale insects and aphides are busy. Locusts are also active.

Australian Orchid Review

Back Numbers and Indexes

● With the March issue (1942) we printed loosely an Index to Volumes 3 and 4. An Index to Volumes 1 and 2 had been previously issued. The Indexes will enable subscribers to have bound their parts of these Volumes. An Index to Volumes 5 and 6 will be published next year, circumstances permitting.

The parts of Volumes 1 to 4 are steadily dwindling in number; stocks of a few issues are very low and will soon be out of print. Readers who do not possess Volumes 1 to 4 with Indexes should make application immediately. Subscription for Volumes 1 and 2 is 16/- (sixteen shillings); for Volumes 3 and 4, with Index, 13/- (thirteen shillings); for Volumes 1 to 4 complete, 29/- (twenty-nine shillings). Remittances should be made payable to Shepherd and Newman Pty. Ltd., Yurong Street, Sydney.

Mackay Jottings

S. R. BROCK, *Mackay, Q.*

● Mackay, being situated right on the coast and in the centre of a small, humid area of plenteous rainfall, has a climate that lends itself to the cultivation of *Dendrobium Phalaenopsis.* This is exemplified in the case of Mr. A. Grant, whose annual display of "Cooktown" Orchids is a floral treat worth any flower lover's coming a long way to see. In previous years there were anything from 1,000 to 1,200 blooms out at once, some of the sprays carrying as many as 18 flowers. This year the plants are showing the same promise of bloom, and next month will again see us, I hope, renewing our acquaintance with these magenta beauties. (April).

Mr. Grant's "Cooktowns" are planted in either elkhorn peat or pure osmunda, and grow to a length of over 3 feet in some cases. I may add that the use of sphagnum moss in the compost is held in abhorrence by Mr. Grant for this type of Orchid. Other growers here who have bushhouses do not get the same results, and so it seems that the glasshouse heat is more beneficial than outdoor treatment for this type of Orchid, in Mackay at least. The exception that proves the rule, however, is the case of a large plant growing on a lemon tree; its annual display consisting of approximately 14 sprays of flowers, each spray averaging 16 flowers. This plant has also seeded each year, and now the base of the lemon tree is a mass of minute plants germinated from the fallen seed.

North Queensland *Dendrobes* such as *superbiens* and *Tofftii* also do well in Mackay and are grown and flowered under all conditions, while Malayan and Phillipine Island types fairly revel in the glasshouse.

Phalaenopsis amabilis grows quite well throughout "the North," and shady bushhouse treatment is all that is required for it.

The *Cattleya* tribe is, perhaps, the easiest of all Orchids to grow, but flowering them is sometimes not so simple. The Curator of the Botanic Gardens, Mr. R. Bell, has recently flowered *Cattleya Dowiana,* var. *chrysotoxa*—a rare plant nowadays, and much more rarer still to find it in bloom.

Cypripediums are also notorious for their lack of bloom, but perseverence may tell in the long run. Last season Mr. Bell and I managed to get lone flowers from *Cypripedium villosum, C. bellatulum,* and *C. Spicerianum,* and these plants with the addition of *Charlesworthii* are again in bud.

Cymbidiums will not thrive here except a very few of the Indian ones from low altitudes, notably *C. pendulum.*

Vandas on the whole, do well, and *Sanderiana* flowers freely with both Mr. Grant and Mr. Bell. *Coerulea* has broken many a grower's heart in North Queensland, but I have been fortunate in saving a plant, one out of three, and it has now flowered two years in succession, and seems to be thriving. In nearly all cases I have heard of, and my own experience bears this out, the crown rots and the plant slowly deteriorates, desperately throwing out side shoots from the stem, which in their turn suffer the same fate, until the plant finally perishes. At first it was thought that our annual "wet" rotted out the crown, but plants kept in dry positions suffered the same way, and the only conclusion we can arrive at is that the coastal humidity causes slow "stewing" to take place. Some of the more uncommon varieties, such as *pumila, Luzonica, insignis,* etc., are flowered regularly by Mr. Graham, whose *Vanda Lowii* (*Aracnanthe Lowii*) is always a source of attraction, when in bloom, to his fellow orchidologists.

● *Orchids on Stamps.*—The recently issued 5½d. Australian postage stamp is printed in a shade of dark blue, showing a likeness of the Emu. At the sides near the head and tail of the Emu there are eight minute flowers which are officially described as the Australian Scented Sun-Orchid. The vernacular Scented Sun-Orchid is applied to the species *Thelymitra aristata* Ldl., being found in all the States except Queensland. The genus extends beyond Australia. If the Postal Authorities are really serious about depicting our Orchids on Australian postage stamps, a representation of *Thelymitra ixioides* Swartz, in two or more colours, would be appropriate, as it is found in all the States. *Dendrobium Phalaenopsis* is another attractive subject. Costa Rica and Gautemala have issued stamps portraying Orchids.

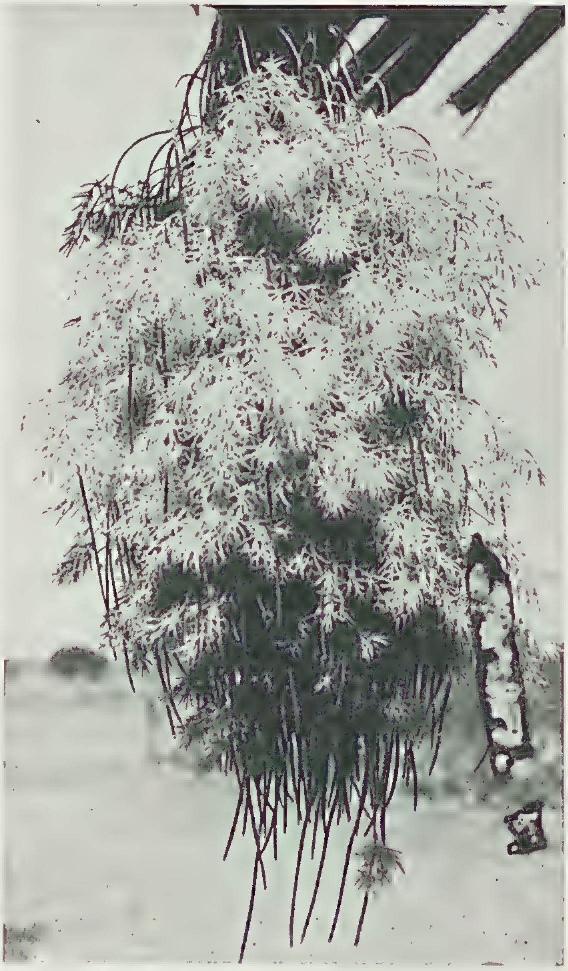
● Membership subscriptions to The Orchid Society of New South Wales for 1942-1943 are now due, and payable to the Honorary Treasurer, Mr. G. J. C. Tosi, 39 Martin Place, Sydney. Outstanding subscriptions should be attended to without delay to enable the Hon. Treasurer to finalise his books for the Annual Meeting.

Dendrobium Teretifolium

C. A. H. SCHNEPEL, *Cordelia, Q.*

● This species is plentiful around here. The plant in the photograph was collected about eleven years ago, and was growing on a small branch (about four inches in diameter) of a Leichhardt tree. About four feet of the branch with the plant hanging from the centre was cut off and hung from a large orange tree, where it could get plenty of light. In fact, the tree on which it is hanging died about a year ago, so it has had practically full sunlight ever since.

A few days before the photograph was taken I placed a few split bamboos over the plant as I considered the mid-day sun was getting too severe. Practically the only watering it has received has been when it rained. The plant from the base to the bottom is 4 feet 2 inches, and diameter is 2 feet, 2 inches. We do not value this species, but this plant seems to be more compact and better shaped than most. It blooms about the same time each year and has a strong perfume.



DENDROBIUM TERETIFOLIUM
Grown and photographed by C. A. H. Schnepel.

● In the "Victorian Naturalist" for April, 1942, Mr. Rupp has a friendly critique of two papers in the same journal for Dec. 1941, by the well-known Victorian orchidologist, W. H. Nicholls. Mr. Rupp disagrees with his colleague's action in placing a new form of *Caladenia* from Portland (Vic.) in Brown's *C. Patersonii,* as var. *hastata,* and thinks that the conspicuously clavate sepals, etc., in conjunction with other features, entitle it to specific rank. He finds himself in complete agreement with Mr. Nicholls, however, in regarding the late Dr. Rogers's *Caladenia cordiformis* as identical with Allan Cunningham's *C. clavigera.* The evidence to this effect, indeed, appears irrefutable. This being so, the question arises as to what should be done with the Orchid figured by Fitzgerald as *C. clavigera?* for not even the most furious opponent of "splitting" could argue that this may lie down with *C. cordiformis* within the same species. Mr. Nicholls would remove it to Fitzgerald's *C. reticulata,* but Mr. Rupp demurs to this, arguing that although Fitzgerald was mistaken in his conception of *C. clavigera,* it is difficult to imagine him dissecting and drawing this flower in full detail, blind all the time to the fact that he was dealing merely with a variety of another species of his own making. Mr. Rupp suggests that Fitzgerald's *clavigera,* which has a wide distribution, should be retained under the new name *C. Fitzgeraldii.*

● In the "Victorian Naturalist" for April, 1942, the Rev. H. M. R. Rupp has two articles dealing with Orchids. In the first he proposes the removal of Robert Brown's *Lyperanthus ellipticus* from *Lyperanthus,* making it the type of a new genus to be known as *Rimacola* ("crevice-dwelling"). It has long been felt by many of our Orchid students that this interesting species was somewhat of an anomaly in *Lyperanthus.* Reasons are given for its removal, and a description of the new genus is appended. It has been suggested that one or two of the New Caledonian species of *Lyperanthus* may have to follow it; but Schlechter's descriptions of these in Engl. Jahrb. scarcely endorse this suggestion.

"Saying it with Orchids"

J. MURRAY COX, *Brisbane, Q.*

Continued from March, 1942, issue

At the end of the passage was another iron door with two sentries on either side. One of these, after listening to the officer, pressed a bell-stud and the door opened to allow Ethelbert and the Lieutenant to enter an anteroom. The Lieutenant motioned towards a chair, and Ethelbert seated himself cautiously, with a tender regard for certain bruises acquired during his rough passage.

After a short wait, during which our hero tried in vain to commence a conversation with his captor (his advances being met consistently with the whispered "Hush!") a door opened quickly and a stout man entered and spoke to the officer.

"Come on, Mr. Smithers," said that young man. "The Fuhrer will see you now."

Ethelbert rose as smartly as his hurts would allow, and, with Lieutenant Von Schlieper-Spittenhausen at his side, entered into the Presence.

* * *

The Dictator's office was designed to create a feeling of awe and embarrassment in his visitors. It was a very long, high room, thickly carpeted, with walls that were decorated with Nazi emblems, enlarged photographs of Hitler in many postures, and a few water-colours, painted by the Fuhrer himself.

At the far end of the room, seated behind a massive table, was one whom Ethelbert had no difficulty in recognising as Herr Hitler, for he had the Charlie Chaplin moustache and the lock of dank black hair falling across his forehead, made familiar by the cartoons and photos published so frequently in the world's press. His eyes looked black and piercing, but when he got nearer our hero found that they were really grey, with extraordinarily large pupils. The face expressed a peculiar mixture of cruelty and morbid sentimentality, of acute intelligence and stubborn stupidity, but of the saving grace of humour there was no trace. On his left was a pile of papers, while at his right hand was a large heap of handkerchiefs, whose corners were marked "A.H.," and whose sides were ornamented with a conventional design in swastikas.

When the visitors were within a few feet of the table, Felix Von Schlieper-Spittenhausen motioned Ethelbert to stop. Then he saluted with the customary " Heil Hitler," which the Fuhrer duly acknowledged. Ethelbert performed his "naval" salute.

"Gracious Herr Fuhrer," said the Lieutenant, "this is the delegate from Australia who desires to discuss with your Excellency certain matters relating to the state of war now existing between that country and the Reich."

The German leader jumped to his feet, his eyes ablaze. "Discuss?" he shrieked in a high-pitched voice that almost resembled a scream. "I NEVER discuss—I DICTATE!"

"I beg your Excellency's pardon," said the Lieutenant, humbly. "What I meant to convey was that this person desires to obtain your Excellency's consent to certain proposals."

The Fuhrer appeared to be mollified. A gentler light came into his eyes. He took one of the handkerchiefs from the pile on the table, blew his nose violently, and then cast the cloth into a wicker basket alongside his chair. He consulted a memorandum pad.

"Mr. Smithers," he said calmly. "I am glad to welcome you to our poor, misunderstood and misrepresented country, which is being so unjustifiably assaulted and assailed by that same tyrannical Power which has for nearly two hundred years crushed your own beautiful southern land under its heavy yoke. But the time of your liberation is at hand. Soon your happy land will be under my protection. Under our guidance you will learn and benefit by our German culture, destined to be the arbiter of peace and goodwill throughout the world, and perhaps in the happier years to be your Australia may attain to the same high ideals and standards which now are the sole privilege of the Germanic peoples. No doubt Mr.-er-er-ah Menzies (he glanced at his pad again) has authorised you to agree to such conditions as I may in my generous discretion postulate——"

"You misunderstand"—broke in Ethelbert as the Fuhrer took a deep breath before going on with his peroration. "Me misunderstand!" choked Herr Hitler, ungrammatically, "I never misunderstand—but I am always misunderstood."

Two furtive tears leaked from each of his eyes, and trickled down his cheeks. He seized a handkerchief from the pile and wiped them away.

Ethelbert was affected by the obvious sorrow of the great man.

"I am sorry, Herr Hitler," he said, gently. "I had no wish to hurt you. What I should have said was that you are mistaken in——"

The Fuhrer stiffened and jumped from his chair as if he had encountered a bent pin placed there by a Gestapo in a frolicsome mood.

"Mistaken!" he yelled. "I, Adolph Hitler, am never mistaken. It is high treason even to think such a thing. Lieutenant, you will place this traitor under close arrest. We will have him served as all traitors deserve to be served. Me—Mistaken!" Emotion overcame him. He seized another handkerchief from the pile and blew his nose violently, and then, under the stress of the moment, wiped his eyes with the same cloth, with unpleasant results. He swore deeply and wiped his face with a fresh handkerchief, which he added to the growing pile in the wicker basket.

"Will your Excellency permit me to explain?" asked the Lieutenant, humbly, his arm raised in salute.

Herr Hitler nodded stiffly.

"I would suggest, Herr Fuhrer, that Mr. Smithers had no intention of offending your Excellency. He has, I understand, lived all his life in a more or less barbaric country which has never had the benefit of Germanic culture or discipline—a country which is addicted to worship of the false god Democracy, which is really only another name for license. He does not realise that true liberty lives in regimentation, that unless the whole of the people of a State are prepared to subordinate their own petty and selfish aspirations into a common fund for the advancement of the good of all, there can be no progress of nation or individual. From my limited associaiton with Mr. Smithers I have formed the opinion that while he has no regular authority from his Government to conclude peace negotiations with your Excellency, he is a man of outstanding courage and initiative, and doubtless, if your Excellency so decides, he would be prepared to take back to Australia such offers as your Excellency may see fit to make, to influence the Government of his country to secede from the British Empire (which God punish) and place itself under the aegis and protection of our Reich. I would humbly suggest, your Excellency, that you hear what Mr. Smithers has to say, and then, in your exceeding wisdom, decide what shall be done."

"You may speak, Mr. Smithers," said the Fuhrer graciously.

Ethelbert drew himself up to his fullest height.

(*To be continued*)

● *Dendrobium Tetragonum Cunn.*—I omitted to add a brief description in Latin of the varieties mentioned in my paper, Australian Orchid Review, Vol. 2, No. 4, page 20, and which is necessary to bring botanical descriptions, varietal and specific, into line with the decisions of the Vienna Convention. The descriptions follow:

Var. *variabilis.* Perianthium flavoviride vel fuscorubrum notationibus rubris. Sepala quotcumque 32 mm longa. Labellum flavum vel pallidum, trilobatum vel aliquando indivisum.

Var. *giganteum.* Perianthium pallidum marginibus fuscorubris. Sepala circiter 63 mm longa; petala 35 mm. Labellum flavum callo ciliato.

Var. *Hayesianum.* Flos sine notationibus. Perianthium flavoviride. Sepala circiter 22 mm longa. Labellum alboluteum.—P. A. Gilbert, 1/6/1942.

● The attendance at the April meeting of the Q.O.S., proved to be the largest for some considerable time, and included many country members, also Lieutenant Coote, of the Malayan Orchid Society. *Vanda Sanderiana,* shown by Miss H. Gilling, was the best seen. It was perfectly leaved to the base, and bore ten beautiful flowers. Eleven other exhibitors staged forty odd plants in flower.

Queensland Orchid Society

The following gentlemen were elected to office for the current year, at the Annual General Meeting held on February 13th:—

President, Leslie C. Home; Vice-Presidents (Metropolitan), J. Gordon Smith, C. A. Hilsden, and J. R. Tanner; (Country), A. Lyons (Cairns), J. Jeffries (Rockhampton) and T. Harris (Coolangatta); Hon. Secretary, T. C. Harveyson; Hon. Treasurer, J. R. Tanner; Hon. Technical Adviser, C. T. White; Hon. Auditor, Allen W. Higgins; Committee, E. J. Beard, A. Bensley, R. G. Ferguson, C. A. Hilsden, W. McK. Robertson, J. Gordon Smith, J. Smolinski, and Dr. D. A. Herbert.

Oncidiums.—I was surprised to find that I could grow *Oncidium papilio,* which is now flowering. It has weathered two winters and is growing on a piece of tree fern stem. This *Oncidium* is interesting, but rarely more than one flower appears at a time. *Oncidium varicosum Rogersii* is a gem, and is particularly easy to grow in pure fibre.—T.H.J., March, 1942.

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AUSTRALIAN ORCHID REVIEW

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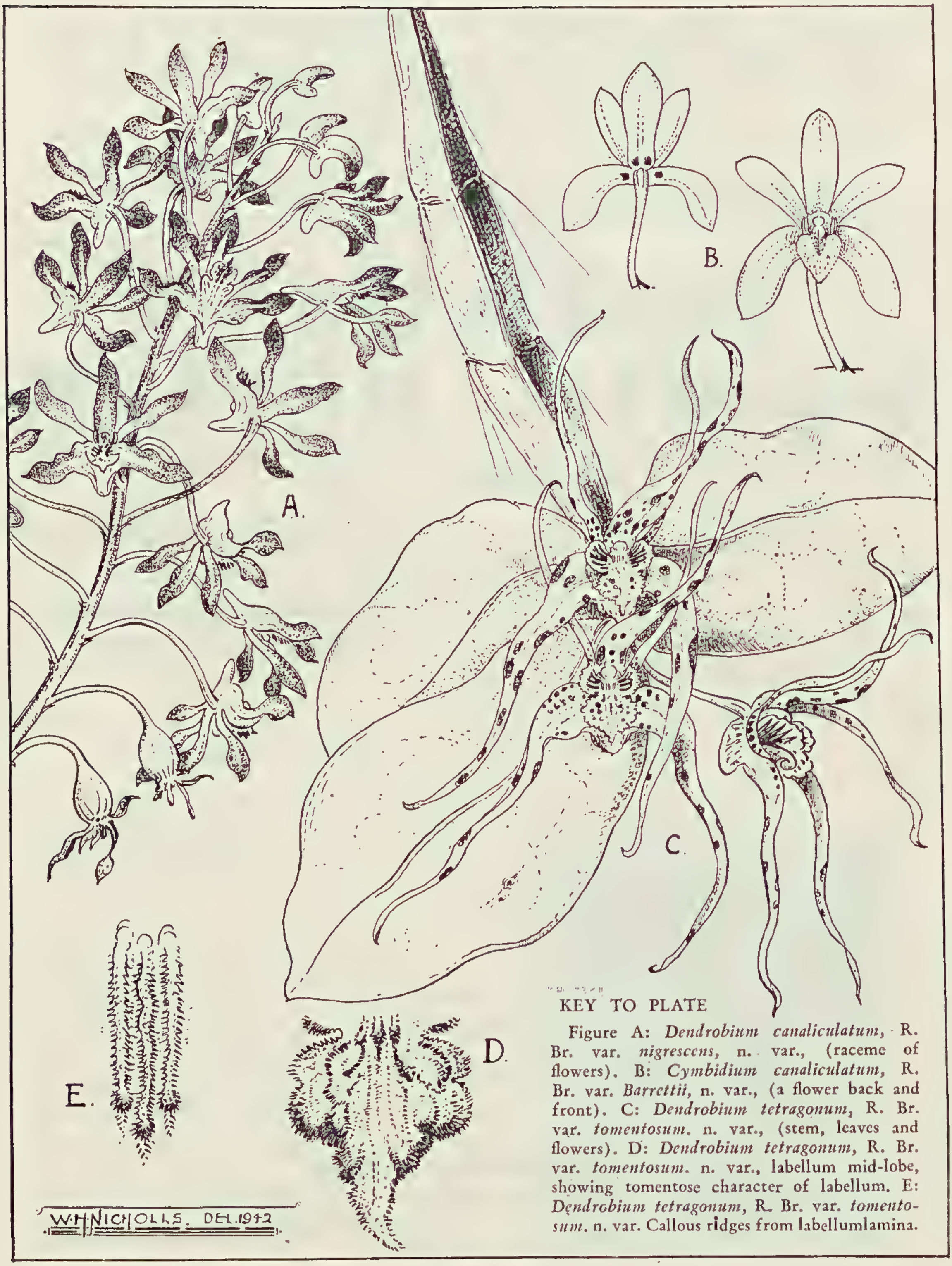


KEY TO PLATE

Figure A: *Dendrobium canaliculatum,* R. Br. var. *nigrescens,* n. var., (raceme of flowers). B: *Cymbidium canaliculatum,* R. Br. var. *Barrettii,* n. var., (a flower back and front). C: *Dendrobium tetragonum,* R. Br. var. *tomentosum.* n. var., (stem, leaves and flowers). D: *Dendrobium tetragonum,* R. Br. var. *tomentosum.* n. var., labellum mid-lobe, showing tomentose character of labellum. E: *Dendrobium tetragonum,* R. Br. var. *tomentosum.* n. var. Callous ridges from labellumlamina.

Illustrations are approximately natural size. See article on page 40.

Australian Orchid Review

Editorial

A Great Orchidologist

● In these times of acute paper shortages, they are of necessity a limitation to the use of words, hence one is handicapped in adequately paying a tribute to the doings of such a distinguished Orchidologist as the late Sir Jeremiah Colman, Bart. His passing away is a great loss to the Orchid lover, whether he is a botanist or horticulturist, as Sir Jeremiah Colman was both in the broadest sense of the names. His Orchidery at Gatton Park, Reigate, England, not only housed many rare, quaint, and beautiful species from all parts of the world, but it also included the cream of the hybrids from his own hybridization, and that of other raisers.

The history of his business, public, sporting, and social activities would, in themselves, fill a very large volume; his achievements in, and contributions to horticulture and orchidology would make another. Orchid lovers are indeed fortunate that such a busy man had been able to contribute a wealth of knowledge to the cultivation of Orchids, and in due course we expect to see a biography, if not an autobiography, of one whose name will persist while Orchidology exists.

But no great man can achieve much without the assistance of his fellow-men, his greatness depending upon his ability to get the best from those he directs. In Orchidology Sir Jeremiah Colman succeeded in engaging thoroughly competent men, whose collaboration with their chief is evidenced by the numerous charming hybrids that have been successfully reared. Two of his best known experts are Mr. Bound, whose name is perpetuated by *Epipendrum x Boundii* (1903), well known to Australian growers by its prolific growth, and the free character of its flowering; and Mr. B. F. Perfect, who has been at Gatton for thirty odd years, and is recorded by *Laeliocattleya* x *B. Perfect* (1907), and other good things which serve as mementos of his skill in hybridization.

Sir Jeremiah Colman was chairman of the Orchid Committee of the Royal Horticultural Society for a number of years, and during his lifelong interest in Orchids he won gold medals, the Cain Challenge Cup, silver cups, First Class Certificates, and Awards of Merit, etc.

Varieties of the following genera enumerated, have been added to the list of hybrids, and will convey some idea of the vast field covered by the Colmanian Orchidery—[*]*Angulocaste, Brassocattleya, Brassodiacrium, Brassolaelia, Brassolaeliocattleya, Calanthe, Cattleya, Coelogyne, Cymbidium, Dendrobium, Diacattleya, Dialaeliocattleya, Epicattleya, Lycaste, Epidendrum, Epidiacrium, Epilaelia, Laelia, Laeliocattleya, Miltonia, Odontioda, Odontoglossum, Phaiocalanthe, Potinara, Promenaea, Sobralia, Sophrolaeliocattleya, Sophrocattleya, Spathoglottis, Thunia, Vuylstekeara.* His first hybrid appears to be *Dendrobium x Neptunne* (1902), and probably one of the last being *Lycaste x Sir Jeremiah Colman* (1938), the the production of hybrids over the intervening years constituting a brilliant record. Although Sir Jeremiah Colman exhibited action over a wide field in hybridization, it can be said that he enriched the (†) *Dendrobium* section more than the other genera, *Dendrobium x Lady Colman* (1909) being a *classic* among hybrids.

The following is an instance of his beneficence: (‡) "Although at first their efforts to interest the Colombo Municipal Council in financing the scheme met with but little response, the donation of a handsome collection of Orchids from Gatton by Sir Jeremiah Colman, instantly altered the attitude of the Council, who promptly voted more than three times the sum originally suggested by the Orchid Circle [of Ceylon] as an initial outlay on the proposed new public Orchid house."

It is a characteristic of great men that they do the right thing at the right time.

REFERENCES

[*] Sander's List of Orchid Hybrids.

† Australian Orchid Review, Vol. 2, No. 1, p. 16.

‡ Orchid Review, Vol. XLIV, No. 521.

Three Interesting Orchids

(New Varieties of old-established Forms). See Frontispiece.

W. H. NICHOLLS, *Melbourne, Vic.*

● 1. *Cymbidium canaliculatum,* R. Br. * variety *Barrettii, n. var. Flores numerosi, pallido-viride-lutei, labellum album.* Flowers numerous, and similar in form to those of the type, but in colour, wholly pale greenish-yellow, the labellum white. In some flowers the outer segments (sepals) are marked, very neatly, on the reverse, at the base, with red.

Habitat: Groote Eylandt, Northern Territory (Mr. Charles Barrett, C.M.Z.S.).

Mr. Barrett's plant (a small specimen) flowered in Melbourne during April (1941). The new variety represents a most interesting addition to the forms already dealt with by the Rev. H. M. R. Rupp (*Proc. Linn. Soc. N.S.W., lix, pts.* 1-2, 1934—also the *Aust Orchid Review, July-Sept,* 1936, *pp.* 11-12), by reason of the exquisitely soft colouring of the flowers, which is in direct contrast to that of the variety *Sparkesii* (C. *Sparkesii,* Rendle), the flowers of which are an intense uniform deep maroon.

2. *Dendrobium canaliculatum,* R. Br. † variety *nigrescens, n. var. Flores in forma, similes typo. Perianthi-segmenta ad basem pallido-viridia; lamina manifeste fusco-nigra.* Flowers as in the type form, but with a different colour scheme. Sepals and petals pale greenish towards the base, the broad lanceolate laminae very deep sepia brown, at first sight appearing as black (in the typical form the prevailing colour is yellow), the labellum white with the usual rich purple-mauve markings.

Habitat (?): The sender of this apparently very rare form, Mr. F. A. Weinthal, of Sydney, writes me (18/4/1941): "It was one of a couple of plants I received from a friend, then (in 1932) at Port Douglas, near Cairns (N. Qld.). Unfortunately, I am unable to give any details, as it was sent to me with other plants collected in that district, including *D. Phalaenopsis,* Fitz G." The plant referred to above consisted of a densely-packed mass of about a dozen pseudo-bulbs, with foliage on the younger stems, all very characteristic of *D. canaliculatum,* with the exception, of course ,of the flowers.

3. *Dendrobium tetragonum,* ‡ Cunn. variety *tomentosum, n. var. Flores magni luteo, ornato-maculati, labelli-lamina tomentosa, cullminibus tribus undulatis ciliatus, apicibus manifesto-ciliatis.* Flowers large (sepals about 5.5-6 cm. long), yellow, ornamented with conspicuous red-brown blotches and spots. Labellum-lamina markedly tomentose, especially on the mid-lobe; callous ridges 3, undulate and ciliate, the apices conspicuously so. Plant somewhat larger than the typical form.

Habitats: Kuranda (W. Fitzpatrick); near Cairns (F. A. Weinthal); Mt. Fox, via Ingham (A. Glindeman)—all Queensland (North) localities.

● An interesting form of *Dendrobium linguiforme* from the Upper Brisbane River has been received from Mr. T. E. Hunt, of Ipswich, Queensland. It comes into bloom early in June; the normal flowering-time for this species is from late September to November. The majority of the leaves are scarcely distinguishable from those of the type form, but there is a tendency to become narrow-elongate and pointed. The inflorescence, however, is precisely that of the North Queensland var. *Nugentii,* except that the colour is cream rather than white. The perianth-segments are much shorter than in the type, and the whole flower is smaller. The mid-lobe of the labellum is perhaps more strikingly crisped-undulate than in the other forms. In var. *Nugentii* (see A.O.R. Dec. 1939, p. 123), the leaves are shortly ovate and exceptionally thick. When Mr. Hunt informed me that the Brisbane River plant flowered in June, I thought it possible that seasonal conditions had perhaps caused the type form to produce flowers out of the usual period; but the plant he sent opened its flowers in my bush-house in Sydney during the first week in June. I propose that this form be known as var. *Huntianum* (Folia saepe elongata, prope acuta; flores palladi, parvissimi, in mensi Junii expandentes).—H. M. R. Rupp.

● At the May meeting of the Queensland Orchid Society, Mr. A. P. Blair raffled two fine *Cattlyea* plants in aid of war funds, the amount raised being £4/4/-.

REFERENCES

* *Prod. Fl. Nov. Holl.* 331 (1810).

† Ibid. 333 (1810).

‡ *Bot. Regist.* 25, Misc. 33 (1839); see also Mr. P. A. Gilbert's article in the Australian Orchid Review, Dec. 1937, pp. 19-20, 26.

Orchids

H. J. CAMPBELL, *Brisbane, Q.*

(These notes have been taken from a book published in London many years ago, the author being one of the greatest Orchid Specialists of the time. His views make interesting reading.)

● Upwards of fifty years' continuous experience with Orchids has necessarily presented to us much evidence as to the right or the wrong methods of carrying out the numerous operations connected with their culture. Nevertheless, it may be said that common sense is one of the most important factors in cultivation, and the grower who carefully thinks over the various problems as they arise, and, profiting by experience, does his best to avoid former failures, will obtain a measure of success far exceeding his expectations. To those who know anything about the ordinary processes of growth and flower, the plants tell their own tale. They show, when actively growing, the period when a reasonable amount of heat and moisture is required, and, on the completion of growth of the deciduous species and the turning yellow of the leaves, they tell just as plainly when the resting period has arrived. It is so in all the important stages of their existence.

Difficulties to Overcome.—Some of the difficulties which the cultivator of Orchids has to contend against arise from the fact that his houses have to accommodate plants which have been brought from widely separated countries, or from different altitudes in the same region. They therefore require very different cultural conditions, especially in the matter of temperature. Consideration of the climatic conditions under which the plants are found growing in their native habitats is very helpful to all engaged in Orchid culture. Many problems have already been worked out by the experience of cultivators, but some of the conclusions have been arrived at only after costly failures. In the early days of Orchid culture, after the advent of the modern Orchid house with its improved methods of ventilation and means for the promotion of humidity, the great mortality among cultivated Orchids was caused by excessive heat and drought. Even at the present day more mischief is done by excessive heat than by cold treatment.

Structure of the Orchid House.—As regards the form of structure, comparatively low, span-roofed houses, with brick sides reaching to the eaves and no side glass, are the best, the ends being of brick up to the heights of the side walls, the remaining part running up to the ridge, in all but very small houses, being formed of wood and glass. If several houses are built, spaces should be left between each house, and no two or more houses should be built with partition walls, for these prevent the necessary side ventilation. A house of 100 feet or so in length should have a division midway in its length, which for some purposes gives the advantage of two houses. Pitch-pine or teak, being durable, are good softwoods for the woodwork, and, in any case, the use of cheap, soft timber should be avoided. In glazing only a thin bedding of putty should be used, and the glass should be bradded on the upper side, as top putty when decaying or becoming loose is worse than useless, and tends seriously to foul the water in the cisterns. Span-roofed houses, 12 feet to 15 feet wide, and of proportionate elevation, are suitable for ordinary Orchids, but if specimen plants are desired a loftier house will be necessary.

The woodwork, when of pitch-pine or other hardwood planed smooth, may be oiled or varnished, painting being undesirable for new houses. In course of time, however, painting has to be resorted to, and it is one of the most trying operations about the Orchid house. Great care has to be taken to obtain a reliable quality of paint that will not harm the plants, and to keep the house vacant for as long a time as possible for the gases from the paint to escape. After the plants are returned to the house some ventilation must be maintained day and night for a time. Tar should not be used inside an Orchid house for any purpose.

Temperature.—One of the most important matters in Orchid cultivation is to see that a lower temperature is maintained at night than in the day. Nothing is more injurious to the plants than to be kept at a high temperature at night, nor is anything more contrary to natural conditions. During the season of active growth any reasonably high temperature by sun heat, secured by keeping the house tolerably close and well shaded, greatly benefits the plants. This is specially noticeable where batches of *Dendrobium nobile, D. Wardianum* and other deciduous *Dendrobiums* are grown. Those who grow them best allow the house containing the plants to become very warm, they remove the shading early in the afternoon in order to let the plants get the longest duration of light possible, and they keep the house very moist until the evening.

Shading.—It should be distinctly understood that every Orchid house needs to be fitted with proper means of shading, extending over the whole roof and removable when necessary. Some cultivators think they meet the case by providing shading only on the sunny side, or by painting the glass with some kind of preparation more or less in the nature of whitewash. Such a preparation should never be used, because when this is once placed on the glass, the shade, such as it is, is there in dull as well as bright weather, and in the night time as well as the day, and for the greater part of the time, especially in dull seasons, it obstructs light which is necessary for the proper development of the plants. Another important objection to their use is that shading given by these washes off and leaves the plants exposed to the full sunlight. The substance is washed off by the rains and carried into the rain water tanks, thus causing injuries to the plants watered with the polluted water and rendering unsightly the foliage moistened with it.

Proper blinds running on iron or wooden supports, raising them well above the glass of the roof, are absolutely necessary. Lath roller blinds are excellent for shading, being durable, clean and easily let down and drawn up. Light canvas or scrim shading fixed to roller blinds answers the purpose well, but care should be taken not to employ heavy, closely woven canvas. Too great attention cannot be paid to the working of these blinds, for they must never be down except when required for protection against the sun's rays, and they must be drawn up during dull intervals. The blinds are useful also during severe winters as a protection against excessive cold at night, and in this particular the lath roller blinds are the best and may be left in position where they are likely to be required for this purpose. When canvas blinds are used during the summer and removed in late autumn, care should be taken to have them perfectly dry before they are stored for the winter in some dry place, or they will be useless when they are required for placing in position the following spring.

The Potting and Basketing Process.—We are often asked what season is the best for potting and basketing Orchids. Experienced growers say that with the exception of the winter season they are engaged in potting operations all the year round, potting each section as it requires it. Springtime is a period when a general overhaul of the plants is usual, and, at that time, plants requiring it should be repotted, but those which are not in the proper condition, or which are showing flower spikes, should be allowed to remain until their flowering time has passed.

As a general rule, it may be said that the best time to perform the operation is soon after the flowering season has passed, and that no plant should be repotted unless it really requires it; but any plant which has become in a bad condition in the pot by being in unsuitable material should be repotted at once, no matter what season it may be.

Propogation by Division.—It used to be thought a very delicate operation to divide an Orchid, or to remove any portion of it for the purpose of obtaining another specimen, and, when the operation was carried out, it was thought to be at the risk of the plant and its offset. In the case of badly grown plants or where the houses are unsuitable for growing Orchids successfully, there may still be considerable risk in the process; but under ordinary conditions, and where the plants have proper accommodation, there is no risk whatever; it may be said that plants are never in better health than when they are divided at reasonable intervals. If we consider the case of *Cypripedium insigne Sanderae,* some of the white *Cattleyas,* and many other Orchids which were imported only as specimens originally but which are now well represented in gardens, the advantage of dividing the plants is readily seen.

Pseudo-bulbous Orchids with progressive rhizomes, such as *Cattleyas, Laelias, Oncidiums* and *Odontoglossums,* should be divided by severing the rhizomes, retaining two or more pseudobulbs together. This operation can be done at any season of the year, but it is most convenient to do it at potting time, and, for preference, just before the commencement of the natural growing season of the plant. Small pieces should be placed in small Orchid pans or baskets, but larger ones may be potted at once and placed on the stage with the other plants.

Watering Epiphytal Orchids.—Success or failure with any class of Orchids depends largely on the exercise of discretion in watering. While it may be said that more specimens are lost by having too little water, especially among the smaller-growing species, than by over-watering, at the same time much mischief is caused by a system of giving a little watering frequently all the year round, without any regard to the periods of growth or rest through which the plants are passing. Such treatment does not provide for strong growth during the growing season, or adequate rest after the growths are finished; consequently, the plants decline in health and the flowers are not satisfactory. Rain-water is the only suitable water for Orchids, and the growers who can command a supply of it all the year round possess a great advantage over those who have to use water from any other source.

During the period of growth and root action too much water at the roots cannot easily be given, provided the material in which the plants are potted is sufficiently porous and the pots or Orchid pans have a sufficient drainage. The rule should be to water thoroughly when watering at all, making sure that the whole of the potting material is moistened well, then not to give more water to that plant until the effect of the watering is seen to be passing, the plant being still moist, but approaching dryness, when the thorough watering should be repeated. Nothing is more misleading than to pour a little water each day on the surface of the material in which the plant is potted. This is often considered to be careful watering, but it results in a large number of plants never getting thoroughly moist at the root, while others in a retentive compost, or where the drainage is defective, become soddened. Such cases may arise occasionally under any conditions, and, where a thoroughly dry plant is found at a season when it should be moist, it is better to plunge the pot or basket in water until it is perfectly soaked. In the case of a plant which is too wet with stagnant moisture, it should either be repotted after the wet potting material has been removed or placed on a shelf to remain without water until it is again in a proper condition to receive it.

Manures for Orchids.—It should be distinctly understood that in the case of true epiphytes, there is no need for manures, and that artificial chemical manures are almost certain to bring about disastrous results, the final collapse being in proportion to the potency of the stimulant used and the recklessness of the grower. Where rain-water can be obtained and stored for use throughout the season, it is safest and most satisfactory to rely on this alone, except for some terrestrial Orchids. The chief difficulty in recommending the use of manures for any class of plants, Orchids especially, is in the fact that once the practice is commenced, even by those cultivators who begin cautiously, they frequently lose discretion in the course of time and ruin their plants by excessive applications. It is for this reason that the growers of plants for market purposes, whose secret of success almost entirely depends on the use of manures, are careful to give out the supplies to the men who have to use them, or, with the very best intentions, they would often destroy the crop. Indeed, it is not uncommon for foremen, or men in charge of departments in large nurseries devoted to growing plants for market, to resort to unfair means to get extra supplies of manure for their plants—and frequently with bad results. There is another curious feature about the use of manures in market gardens, namely, that all concerned observe the greatest secrecy in the matter, and rarely admit that they use "anything but water"—that being the common expression. The same secrecy is observed by the Orchid expert in most cases. Another thing is that there is no common formula accepted by all practitioners. Each seems to have his own opinions as to materials, quality, and strength of the stimulants used.

Resting Orchids.—Whilst we may definitely say that all Orchids require a resting season in some degree the cultivator must be careful to arrange the resting season, in the matter of its duration and other particulars, in accordance with the nature of the plant, for in some classes of Orchids it is very easy to do much mischief by subjecting them to a too prolonged and rigorous resting time. Seedling Orchids, as a rule, require little or no resting season until after their first flowering, and *Cattleyas, Laeliocattleyas* and other evergreen hybrids require a rather shorter period of rest than deciduous species.

Diseases and Insect Pests.—There is very much in the old-time advice, "Grow your plants clean," for a very large proportion of Orchid diseases and insect pests are due to errors in cultivation, more especially in the regulation of the temperature and the ventilation. Insanitary houses lower the vitality of the plants, and vegetation, like human beings, is a prey to disease when kept in unhealthy conditions.

Cockroaches.—The first of these insects to be noticed should be the signal for the laying of poison. Various preparations are recommended, the best still seems to be the old phosphor paste, which should be placed on pieces of paper in the haunts of the insects in the evening, and removed the next morning, a fresh supply being put down every two or three days so long as one of the insects remains.

Slugs, Snails and Woodlice.—To combat these is more a question of diligence than anything else. The old remedies to attract them, such as lettuce leaves, or hollowed halves of potatoes, are still effective, and a walk around the houses with a light at night never goes unrewarded.

Orchids as Cut Flowers.—A large proportion of the flowers of Orchids used for decorative purposes are in a great degree wasted by being cut in an immature state soon after the buds have expanded. Such flowers last but a very short time, and, if used for decoration by night, are only presentable for one evening. Orchid flowers should not be cut until they are fully mature and their tissues hardened. They last longer even if they are cut when they are past their best, than they do if cut too soon after expanding. When mature, the flowers require less support from moisture passing up the stem than most flowers, but if cut in an undeveloped state sufficient moisture cannot be obtained through the stems, even if well supplied with water, to continue the development, and the petals droop and the flowers soon wilt.

When Orchid flowers are to be used for decorative purposes, no matter in what stage of development they may be, it adds greatly to their durability if they are placed head downward, thoroughly immersed in clean water (rain-water for preference) and kept so immersed until an hour or so before they are set up, gently shaking the water from them, and placing them on a cloth or some dry, cool surface until wanted. Treated in this way, Orchid flowers will last for weeks instead of days. The method should be to take them out of the dining room or other place where they have been used after the guests have departed each evening. Have ready a large earthenware pan filled with water, and in it immerse the Orchid flowers, leaving them immersed until shortly before they are required to be set up again next day, repeating the same treatment every night. Managed in this way, sprays of *Odontoglossums* and other Orchids often last for weeks, and look better than freshly-cut immature flowers do even on the first day. Flowers received by post should always be treated to the bath for some hours, and during immersion any defects which are reparable will be made good and the duration of the flowers ensured, especially if the immersion be repeated as before recommended. It might also be said that the maidenhair fern, also *Asparagus plumosus* and other foliage used with the cut Orchids are materially benefited by immersion, the maidenhair fern especially should always be kept immersed until required for use.

Importing Orchids. — Many interesting Orchids have been imported by amateurs who have friends or correspondents in the countries which Orchids inhabit, and many more would have arrived alive if the persons who sent them possessed some knowledge of the best methods of collecting, packing and forwarding the plants. The lack of this knowledge often results in the trouble the collector has taken being in vain, and disappointment to the receiver who gets the dead plants and has to tell his correspondent the sad tale of failure. Orchids should be gathered and forwarded during their resting season, and with sufficient time between their being sent off and their natural growing season to allow of the period of their transit being made before their resting season expires.

Treatment of Imported Orchids.—Much depends on the conditions of the importations, whether they have been collected at the proper time, and whether they have been properly packed and forwarded. Many imported Orchids offered for sale cannot possibly do well, as from improper packing they have "heated," or become subjected to excessive heat or cold whilst on board. Cases of Orchids awaiting transit are often left on the landings in the full sun and become partially desiccated, though while dry still retaining a green appearance. Such collectors' failures die rapidly as soon as heat and moisture are given, and even in the case of those which seem to establish a healthy appearance of the pseudo-bulbs, growth is not possible, as the growth buds have been dried up. It is waste of time trying to bring such plants round, therefore care should be taken not to purchase them at any price. Imported Orchids of all kinds should be trimmed over as soon as they are received and damaged parts removed, and the plants placed in a cool, intermediate temperature after they have been sponged over. They may be suspended for a few days and afterwards placed in small pots of broken crocks. Pseudo-bulbuous Orchids, such as *Odontoglossums* and *Cattleyas,* should not be watered, but they may be sponged occasionally until growth commences, when they should be potted in the usual manner.

● The plant of *Dendrobium Phalaenopsis* var. *alba,* owned by Mr. W. L. Haenke, grown by Mr. W. Parton, and shown at the May meeting of the Queensland Orchid Society, was judged by those present as the finest plant of the variety seen. It had six sprays of pure white flowers, each of which showed the pale green tinge in the throat, denoting the true *alba* variety.

Cool House Culture and Notes for Amateurs

T. H. JAMES, *Hazelbrook, N.S.W.*

● September heralds in another spring, and with it our hopes of more and better growth and blooms from our Orchids. This year we have much more to worry about and hope for than our plants, but I think that a hobby is a definite mental relaxation, and in the present World conditions plays a big part in helping us to carry on. Hobbies embracing flowers, particularly Orchids, even when mostly used for commercial purposes, seem to offer more real solace and distraction than those associated with inanimate subjects. Watching the growth of an Orchid, and the development and opening of the flower is to me, and I am sure to all Orchid growers, most fascinating, particularly if it is a plant's first flowering. There is even the pastime, known as "spiking." This is the term applied to the hopeful search during autumn for *Cymbidium* flower spikes.

Personally I am at an uncertain stage. I have moved from sea level to an elevation of 2,300 feet, and am wondering how my Orchids are going to be affected. The *Cypripediums* are flowering profusely and still growing well. How much of that is due to reserves built up in Sydney, or a liking for the new conditions remains to be seen. One surprising and disappointing feature is that about 20 *Cattleyas,* some with three and four sheaths, which should have flowered in April, did not flower until mid-July and August, when the weather was bitterly cold with the thermometer on several occasions between 23 and 28 degrees F. I had intended to use hessian blinds to let down on very cold nights to retard radiation of heat, but that material and many others were "frozen" by the Government, so that during the very cold spell with strong icy winds, I was not able to maintain sufficient heat to open those *Cattleya* flowers to their usual size.

Ventilation.—From now on the weather, except for an occasional cold day, should be sufficiently mild to hot to permit of all the ventilation it is possible to supply both day and night, particularly on the north side. Our prevailing summer breeze—the nor-easter—is heavily charged with moisture. Close much of this ventilation should a hot wind develop.

Light.—I used to worry once about blinds during the summer, but that idea, like many others has gone into the discard. During last summer I used no blinds of any kind, and what paint there was had become very thin. Yet nothing burned. There was a slight yellow tinge in a few *Cattleya* leaves, but not even as much of that as I anticipated. Provided the plants are well watered, no shading other than very thin paint—such as mill white with a little raw linseed oil—is necessary. In fact, I believe better growth will result from very light shading.

Watering.—New growth will have commenced by now, or will shortly, and when root action is seen regular watering will be necessary. I shall again supply most of that water in the evening as done last year. Its benefit was too obvious on my plants for me to consider the old idea of watering only in the mornings. Grow moss on the benches or use peat moss to provide humidity. For benches up here I have used fibro-cement sheets on which has been placed cinders (railway engine clinker), and sphagnum and other mosses are now growing freely on it.

Cattleyas.—Apart from the flowering circumstances mentioned earlier in these notes, the *Cattleyas,* so far, do not appear to resent the change. Any repotting that may be necessary could now be done. I again advise strongly against the use of sphagnum moss in the compost, but I would use it to top all pots and baskets as soon as roots begin to grow. Then aim to keep the moss green. As a substitute for fibre, a writer advised having used—with excellent results—shavings of tree fern trunks. I have for some time used tan bark, from which the finer part had been sifted, mixed with fibre. The plants appreciated the mixture. I have two plants in this coarse tan bark only, and the results are so satisfactory that I propose to use more of this in future. Abundance of water would be required. I should now advise watering your Cattleyas in the evening except on dull, cold, or wet days. I have done so for two years now, and to my mind there is no doubt as to the excellent results.

Cypripediums.—Except for a few summer flowering varieties, all flowering has finished and any repotting necessary should receive attention. I would urge the building up of large specimens, not the continual cutting up into small pieces as so often practiced. Apart from two plants of *Cypripedium insigne* which produced 13 and 16 flowers respectively, many of my other plants this year produced from 4 to 7 flowers. I shall merely place them in larger pots and disturb the roots as little as possible. It may be necessary to cut away about an inch of the roots at the bottom of pot to permit drainage in the new pot, but that will not affect them. If a plant is not growing satisfactorily there is something wrong with the roots or compost. Take it out of pot, thoroughly wash the roots, cut away all that may be dead or unhealthy, and then repot into a fresh pot and compost. Give plenty of air and water. I would suggest, as mentioned in the March Review, giving your plants a little bone dust—just sprinkled on the surface. I am uncertain of the effect of this manure on a heavy compost and would therefore advise caution, but with tan bark it certainly improved growth.

Dendrobiums with me this spring, are a great disappointment. From the luxuriant growth during the last two years I expected abundant flowering. It is quite the reverse. I have inquired from many as to a possible cause, but without result. The new bulbs produced this year failed to make their own roots until May and June, and consequently "sponged" on their parents to such an extent that many were still slightly shrivelled in August. This obviously is the cause of the poor flowering, but what is the cause of this late rooting. The only factor which occurs to me is that whilst away during November and December an enthusiastic neighbour regularly dipped those plants each evening. That abundant supply of water probably removed the necessity for the new bulbs to make roots. I do not think it wise to give *Dendrobiums* much water until new roots appear.

Cymbidiums.—I have now become reconciled to the few flowers produced this year, due to heavy shading on account of water restrictions, in the knowledge that I have saved my plants, and that they have grown well. I would again refer to the general opinion of members of The Orchid Society of N.S.W. as mentioned in the June Review that light is essential to successful flowering. Many believe that light is more important than compost. Plants should, therefore, be placed where they receive plenty of sunlight but protected from hot winds, preferably on the eastern side of a fence. If kept well watered, no sun will burn the foliage. I believe any light, moderately rich, but open compost will serve, but avoid cow manure.

Thunias.—These beautiful Christmas Orchids will now have made their new shoots. Pull away dead bulbs and roots and replant in light rich compost. Water sparingly until the new growths are about two inches high, and then give abundance. Place in full sunlight.

Notes on Culture

J. SMOLINSKI, *Brisbane, Q.*

● During the dry spell we Orchid growers have had a trying time, but the rains have made an improvement in the growing of Orchids in glass-houses and bush-houses. I have very little to say after reading Mr. H. J. Campbell's article of a grower of fifty years' experience in England, and other countries. I am still a firm believer in growing *Cattleyas* in wooden baskets, since I have given up pots except for my small plants.

The best plan I find for watering Orchid plants, is to soak them in a tub of water once a week in hot weather. I also spray overhead when necessary to cool the glass-house, and damp the floor which causes much humidity to force growth. The best time to cut up large plants is after the flowers are removed, and the plants have been left to rest some time before doing so. The best material to use is osmunda and polypodium fibre.

When I get information from overseas growers who have been growing Orchids for 35 to 40 years, and who have made a wonderful success of it, it is worth following their advice. We must put in so much time and care, and use common sense as to conditions, and positions must be studied which are higher and are free from cold winds from the west. In the glass-house we must have as much fresh air as possible.

My object in growing *Cattleyas* is to study, and make a success of getting the best results with larger flowers, better colour and vigour, and keep on trying and trying again. Don't go to sleep if you are disappointed at any time. I hope all growers will make a study of the wonderful article prepared by Mr. H. J. Campbell which appears in this issue.

● In a discussion on *Cymbidiums* at the April meeting of the Orchid Society of N.S.W., the following points were gleaned: That growers give their plants plenty of water during the hot weather; grow them in full, or nearly full, sunlight; and use moderate amounts of liquid manure.

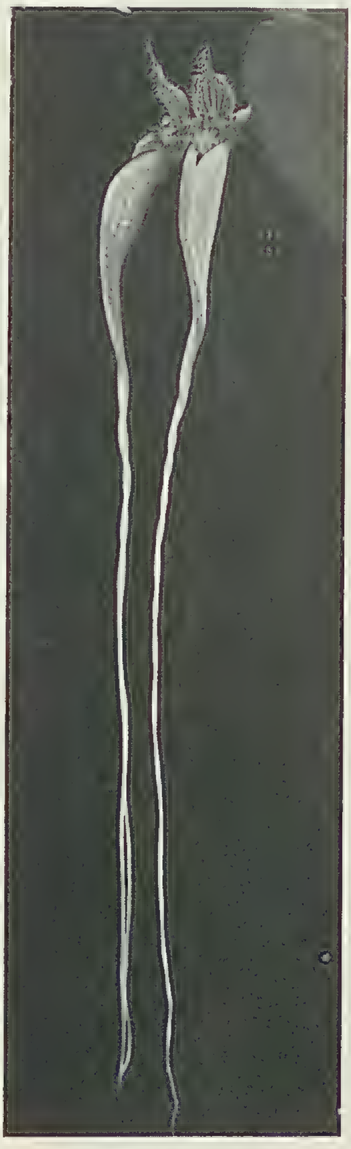
An Extraordinary Hybrid

G. HERMON SLADE, *Manly, N.S.W.*

● There are few Orchid growers who, at some time or other, do not buy an Orchid which they feel is going to be something quite spectacular and thoroughly different. Surprising Orchids have always been a particular attraction of mine, and the vast field of species has usually given far more real surprises than variations amongst hybrid Orchids.

When going through an Orchid house in England in 1937, I happened to see an Orchid labelled *Cirrhopetalum Louis Sander. Cirrhopetalums* always seem among the really strange Orchids—some I have seen with flowers that are small, others with flowers of remarkable colour or with peculiar form. The element of surprise and novelty is always present.

Looking for surprises, therefore, *Cirrhopetalum Louis Sander* seemed to have—as far as name is concerned, anyway—everything I wanted. The plant was brought out in my cabin, and arrived here not nearly so well as most plants do when they are packed in cases, despite the fact that it was watered from day to day. Nevertheless, it was put in the glass-house and eventually became one of the really healthy looking plants in the collection. It was regularly examined for flower spikes, but two years went past and it continued to grow without showing the slightest inclination to flower. Imagine my surprise when, a few weeks ago, on walking into the glass-house I noticed that not only had the *Cirrhopetalum* decided to bud, but these were already on the end of a stem 10 inches long, and the flower buds, although not yet open, with long tails on them about 9 inches long, looking as if they would be out at any time. The flower spike brushed against my face in the dark, and it was one of the greatest surprises I have had to notice that this plant was at long last going to flower.



CIRRHOPETALUM X
LOUIS SANDER

Grown by G. Herman Slade, Manly. Photo by H. J. R. Overall, Manly. Photograph much reduced. Total length of flower, 12 inches.

The flower itself fulfilled all I desired of it.

Its form is peculiar in the extreme, two long sepals are 10 or 11 inches long, at least; the dorsal sepal is beautifully haired and is about three-quarters of an inch long, caving over the column; the petals are minute in the extreme, and have to be examined very closely even to be found. The labellum is typical of the *Cirrhopetalums* and is extremely mobile, moving with the slightest breeze or touch. The flower itself is of almost pure white with purple flecks, while the labellum is a beautifully rich purple. Conscientious claims for beauty of form or grace could not be made by this Orchid, but it certainly is most spectacular, and is a plant which is well worth growing. It has succeeded for a number of years in a small basket, and this year has produced five flower spikes, apparently making up for time lost.

● At the June meeting of the Orchid Society of N.S.W., Dr. C. Hall donated 19 plants of the *Cattleya* group which were sold by auction to members, the proceeds, £13/14/6, going to the Lord Mayor's Comforts Fund.

● *Cymbidium x Cyzarra* is a desirable variety to have, being colourful and shapely.

● The obituary notice of Sir Jeremiah Colman, Bart., in the June issue was contributed by Matron F. Burt, a well-known member of the Orchid Society of N.S.W., and not by Nurse Burt, as shown.

Suitable Timbers for Orchid Baskets

S. R. BROCK, *Mackay, Q.*

● When a beginner at growing Orchids, I was under the impression that the only suitable medium for Orchid baskets was teak wood, this was, no doubt, because all the Orchid catalogues I perused stipulated teak baskets for their wares.

On many occasions teak was unprocurable, so, perforce, I had to fall back on local or native timber, and though at first I was dubious as to the results I soon found that the Orchids suffered no harm, and the roots embraced the substitute timber quite as well as they did the teak.

Here is a summary of the information I gained, and also a few facts concerning the various timbers mentioned:—

Firstly, a few remarks on our Australian Grey Teak (*Gmelina Leichhardtii*), commonly known as Grey or White Beech. This timber is found scattered along the Queensland and New South Wales coasts from Cape York to the Shoalhaven River, and is lighter in weight and more porous than Indian Teak (*Gmelina arborea*). Quoting from "The Timbers & Forest Products of Queensland," by E. H. F. Swain:—"Grey Teak relies for special advantages upon softness, lightness, toughness and mellow workability, combined with a high degree of durability in or out of weather and a refusal to swell or shrink or alter in shape when wetted or subjected to untoward conditions." It would seem thus an ideal timber for our purpose, and most of us have, I think, used this timber freely and with good results, for our baskets.

Red Stringybark, or Red Messmate (*Eucalyptus resinifera*) is my favourite basket wood. It is an open grained timber, works easily, and gives a nicely coloured, finished surface. It grows in scattered stands from Atherton to the McPherson Range, mainly along the south-eastern coast. I have had good results with *Cattleyas* and *Dendrobium pulchellum, D. superbiens, D. undulatum,* and *D. thyrsiflorum,* in baskets of this wood, the roots taking to it quite well.

Spotted Gum (*Eucalyptus maculata*) has been an excellent receptacle for *Dendrobium speciosum,* though one might imagine the high oil content of this timber to be detrimental.

Queensland Red Gum (*Eucalyptus tereticornis*) is another timber of high durability in damp situations, and a *Saccolabium giganteum* of mine shows a great affinity for it.

Red Cedar (*Cedrela Toona, var. australis*) with its open grain and woolly fibre, makes an excellent basket for *Cattleyas,* and our local Curator of the Botanic Gardens uses nothing else. It also has the advantages of being easy to work and very durable in or out of the weather.

Another timber very similar to beech in chemical content, in fact its acidity is practically the same, is Queensland Maple (*Flindersia Pimenteliana*), and a *Dendrobium pulchellum* planted in a maple basket liked it exceedingly well. Unfortunately it will not stand up to the constant wetting and drying.

Treefern baskets are *par excellence* for *Cattleyas,* and doubtless for other types of Orchids as well. It is hard to get hold of, fortunately, (I say "fortunately" from a nature lover's view, not an Orchid enthusiast's), and is very difficult to work. Some growers boil it to remove the excess tannin, which they consider injurious to the Orchid. I must confess that I have been afraid to fly in the face of their experience, and always treat it that way myself to be on the safe side.

At present I am trying mangrove wood in a basket for a *Dendrobium Tofftii,* seeing that it grows in its natural state on the mangroves. It is too soon to record the result, but I have every hope of being successful.

From those few examples it is obvious that practically the majority of our timbers are quite suitable for basket culture, and the grower who is held up for beech or teak can readily substitute something else in its place. Or, as my fellow-growers here say, "the basket is only to hold the compost and ensure good drainage, if they don't like it, let the roots go back into the compost again."

One of the finest *Aerides odoratum* I have seen was growing in a basket made of white painted, round baluster rails, and the roots didn't seem to worry much about the paint, they just grew along those rails in a normal fashion. I did, however, see quite recently, on one of my jaunts, some wooden baskets treated with creosote, and exposed to the weather for some time to age them before potting up the Orchids. I'm blest if I know how they are going to get on, but with all the new-fangled fertilisers, and diets for Orchids, nothing can surprise me these days.

And now a few details of the basket construction may not be amiss. Firstly, all holes in hardwood baskets should be drilled, both the ends and the bottom pieces, which are easiest put on by using copper nails and clinching over the ends. Copper wire should always be used for the corner holding wires and suspension wires. Orchids detest galvanised wire, even their foliage reacting to it when allowed to lie against it. In our northern climate it is bad practice to allow any wire to touch the plant, as the sun heats up the wire, which burns the plant.

The wooden slats of my baskets are always planed smooth, the reason being that I have to live with my Orchids all the year as well as when they are in bloom, and neat, tradesmanlike baskets of nice colour and finish help to offset the—in some cases—drabness of the plants, while the slight advantage the rough wood offers the roots in taking hold is well worth sacrificing. I find that a ¾ inch square slat makes a neat job, and is applicable to all sizes of baskets.

In conclusion, I would like to point out that hardwood baskets also have the advantage of hanging without swaying and turning. They counteract a plant tending to be top heavy, and when dipping (I am a great believer in this), they can be placed in the dipping tub and left to themselves for a period, neither turning over, due to too much top hamper, or rising to the surface, due to their buoyancy, thus leaving one free to attend to other plants while waiting for the given dipping period to expire.

● ***The Late Mr. J. R. Tanner:*** On Thursday, June 25th, 1942, at 11.45 p.m., our highly esteemed and dear friend Jim Tanner, suddenly passed away. Since the latter part of last year, Mr. Tanner had been suffering from heart trouble, and we who knew him well experienced no surprise to learn the sad news. Nevertheless the stunning blow caused by his passing was felt no less keenly by the many close friends in The Queensland Orchid Society, and the commercial world in general. Mr. Tanner, who was a Life Member by honour, was our Treasurer since the foundation of the Society, and in his passing the Society has lost not only a member who worked ceaselessly for the benefit of others, but a true friend who was dearly loved by all who had the pleasure of knowing him. We mourn his loss and extend to his widow and his two boys, who are serving with the A.I.F., our heartfelt sympathy. —(The Queensland Orchid Society).

PHAIUS GRANDIFOLIUS
Grown by S. Brock, Mackay. Photo by H. Pysden.

● In the May issue of the *Queensland Naturalist* the Rev. H. M. R. Rupp has a note about the occurrance of Mueller's *Pterostylis Daintreyana* in Queensland. This quaint little Greenhood was generally suppposed to be restricted to the Hawkesbury Sandstone area of New South Wales, along the central coast, where it flowers in the autumn on wet mossy rock-ledges. In May, 1937, Dr. C. P. Ledward, of Burleigh Heads, S.Q., found it at an altitude of 2000 feet on the Macpherson Range. It was then discovered that the late F. M. Bailey had recorded it from Ipswich in 1910, the collector being Mr. T. F. Hall. Mr. Rupp, upon examining the Ipswich specimens from the Brisbane Herbarium, found them to be *P. parviflora*. Mr. C. T. White states that they are nevertheless of considerable value as constituting the first definite record of *P. parviflora* within the State.

● Subscriptions for the Australian Orchid Review, 6/- (six shillings), should be posted to Australian Orchid Review, c/o Messrs. Shepherd and Newman Pty. Ltd., Yurong Street, Sydney, N.S.W.

The Occurrence of Giants and Dwarfs in Certain Species of Australian Orchids

Rev. H. M. R. RUPP, *Northbridge, N.S.W.*

● I am not aware whether the phenomenon here discussed has been observed among exotic Orchids; but it presents an interesting field for study in some of our native species. Of course it goes without saying that all flowering plants exhibit wide variability in the dimensions of both individual plants and flowers. A plant in an unfavourable environment, or in unsuitable soil, will not show to advantage against one more happily placed. So, too, drought on the one hand or excessive moisture on the other, may hinder proper development. But causes such as these cannot account for the giant and dwarf forms of Orchid flowers which are the subject of these notes. Put your plants all under the most favourable circumstances, and the giants will still be giants and the dwarfs dwarfs. There must be some underlying causes of this freakishness, but what they are I confess I cannot imagine. Natural hydridization? Possibly, in certain cases; but assuredly not in all. Natural hybridization may explain why *Dendrobium speciosum* possesses a variety, called *gracillimum*, which invariably has flowers rather less than half the size of the typical flowers; because the form and relative dimensions of the *gracillimum* plant irresistibly suggest an intermediate between *D. speciosum* and *D. gracilicaule*. Nevertheless the evidence is far from complete; nor is it at all strengthened by the fact that there is a robust, stout-stemmed form of *D. speciosum*, not in the least resembling *D. gracilicaule*, which yet produces small, short-segmented flowers indistinguishable from those of *gracillimum*. The Rock Lily is a tricksy jade.

Hybridization can offer no solution to the vagaries of two other species of *Dendrobium; D. teretifolium* and *D. tetragonum*. The former produces plants with giant flowers under precisely the same conditions as apply to those with normal flowers. I remember finding several plants of this species on a swamp-oak tree in the Paterson district. In the case of two of these plants the flowers were more than twice as large as those on the others. Why? All the plants were apparently equally healthy. In southern Queensland the yellow-flowering variety *aureum* produces flowers of normal size, but quite as often plants occur with the floral segments nearly three times as long as in the typical form. Coming to *D. tetragonum*, we find it dimorphous in New South Wales and South Queensland; a small-flowered form with sepals hardly exceeding 2 cm. in length, and a large-flowered form with sepals exceeding 4 cm. Both grow under favourable and similar conditions. In North Queensland, however, both these forms give place to a third, with a more richly-coloured labellum, and sepals up to 8½ cm. in length. Tropical climate? Perhaps; but two of those plants which I have had growing for the past nine years down here continue to produce these giant flowers quite cheerfully, under very different conditions from those of their original home.

Pass now to a species of another genus, this time a terrestrial. *Thelymitra venosa*, a blue-flowered Orchid with dark veins traversing the perianth, is found in New South Wales, Victoria, South Australia, Tasmania, and New Zealand. It is principally a highland species, but not exclusively so, for it occurs about Port Jackson. In the typical form it is not large or particularly attractive; the flowers would probably not average more than 2 cm in diameter. But in a few special areas in New South Wales (the Blue Mountains, Bulli Pass, and Mount Kembla) there occurs the beautiful var. *magnifica*, with flowers up to nearly 6 cm in diameter; one of the loveliest of our terrestrials. It grows exclusively in boggy soil; but so, in this State at all events, does the type form. Hybridization is quite out of court here, for there is no species of the genus in the State which, crossed with the typical *T. venosa*, could produce a flower like this.

I cannot give all the illustrations of this phenomenon I should like to; space forbids. I may just mention three other terrestrials which exhibit it; *Diuris pedunculata, Pterostylis acuminata*, and *Caledenia carnea*. Each of these has a giant variety which has been deemed worthy of a published name. The subject is rather a fascinating one, and some of our younger naturalists might find it worth while to investigate.

● Membership subscriptions to The Orchid Society of New South Wales for 1942-1943 are now due and payable to the Honorary Treasurer, Mr. G. J. C. Tosi, 39 Martin Place, Sydney. An immediate settlement of overdue subscriptions will be appreciated.

Remarks and Questions about Orchids

J. GORDON SMITH, *Brisbane, Q.*

● Doubtless many of you have heard these remarks, and have been asked some of these questions about Orchids.

Oh! You grow Orchids! They must take up all your spare time! They are most difficult to grow! You must know all about gardening! What an expensive hobby! Do the plants multiply so that you can sell the young plants? Do you sell your blooms? How much is your collection worth? How many Orchids have you got? Can you buy books about Orchids?

Most of these remarks, strange to say, are usually passed by people who know far more about gardening than I am ever likely to know, yet, how they imagine that there can be any connection between gardening and Orchid growing apart from common sense I cannot understand. It has often occurred to me what a person would be called if he told some of these folk, that, where 24 hours of mismanagement will kill many annuals, it would possibly take as many months to kill an Orchid.

Generally speaking I only see my plants at the week-ends, and am often away for upwards to three weeks at a time, so that my Orchids do not get a great deal of time spent on them.

One explains that Orchids are grown in osmunda fibre, peat, etc., only to be told—fancy, I thought that they grew in soil! Regarding prices I have said that plants have been landed from India at from 3/6 to 7/6 each; from Java at 3/6 and 4/6 each. Then comes another question—What do those with the big flowers (*Cattleyas* they mean) cost? English hybrid seedlings land at from 12/6 to 24/- each. This reply brings the question—Why are the flowers so expensive? You explain that most Orchids flower only once a year.

I find that these people have read some extraordinary tale of a wealthy grower having sent out a party to some remote region to secure some fantastic plant that has never previously been seen in a collection. I have read that when the first plant of *Cypripedium Fairrieanum* reached England it was sold for £1000. To-day this plant can be purchased for 6/-. Possibly such reports have caused people to believe that Orchids cost fabulous prices.

To the questions—"How much is your collection worth"? "How many Orchids have you got"? I truthfully reply that I do not know. Regarding the selling of blooms and plants this aspect of Orchid growing has never occurred to me, as from my point of view it is a hobby from which I get a lot of pleasure, not a business to have a price put on it.

There are many books on Orchids, and Orchid Culture, some of which contain coloured plates which are of special interest. Probably you will not agree with me, but the only use that I have for the books is for the descriptions of the blooms, and of where the plants come from. As most of the books have been written in England they deal with English conditions, where most of the Orchids are grown in heated glass-houses, and naturally, while these conditions would be helpful to growers in Tasmania, they are of little use to us here in Queensland.

Composts as used in England do not in the main suit Queensland conditions, the most outstanding example being the use of sphagnum moss. Here it soon dries out, perishes, and loses its value.

The greater part of my knowledge of Orchids has been gained by seeing other collections. Observing just how the plants are grown, if they are healthy, and growing well; one considers the light that the plants get, and such factors that constitute the common sense treatment of Orchids. If one is able to make a fair comparison he can often learn much to remedy any faults he might have in his own methods. Often he is asked how do you grow so-and-so; ideas are exchanged to the mutual benefit of both parties. This, in my opinion, makes Orchid growing so much more interesting.

In my travels I have heard some amazing things about Orchids. For instance, it is really marvellous how many people know where to get the White Cooktown Orchid, *Dendrobium Phalaenopsis* var. *alba*—and yet in the past 18 years I have not seen more than six plants. Many of the flowers have a pink flush in the sepals and petals, or a pink throat, but this is not *alba*, for the true *alba* has pure white sepals and petals, and a green throat. I have also been told of black, blue, pink and red Orchids all growing in Queensland. The *blue is definitely non-existent, while the black and red are probably accounted for by *Cymbidium canaliculatum*. The pink which I have not yet seen, appears to be a form of *Dendrobium undulatum*, which probably does exist, for I have noticed it quoted

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"Saying it with Orchids"

J. MURRAY COX, *Brisbane, Q.*

Continued from June, 1942, issue

"Herr Hitler, I have sailed my own launch all the way from Australia to Germany simply to place before you my own ideas regarding this war in which we are involved. I am an ordinary private citizen of Australia, and I am not interested in any way in European affairs. So far as I am concerned you can have the lot. My chief interest in life is the cultivation of the plants known as Orchids—the loveliest plants in the whole realm of flowers. Since the War started my shipments of plants have been torpedoed and sunk; orders from suppliers cannot be delivered; chemicals for the destruction of pests and the treatment of disease cannot be had. I have never done anything to interfere with you, and I don't see why you should interfere with me. I am not interested in politics, either local or international—in fact, I cannot understand why you or anyone else should bother yourselves with them. My opinion is that your whole life has gone awry because you have no hobby. So I have brought some of my choicest plants with me, so that you can see just how wonderful and fascinating they are. I am quite sure that when you have examined those plants you will find that the world is well lost to anyone who makes Orchid growing his chief interest in life. Just come along with the Lieutenant here and me, and see them. You are an artist by your own election, and to an artist beauty is the supreme objective of the cultured man. Your difficulty is that your artistic expression has been choked and frustrated by the circumstances that surrounded your youth, when your talent was seeking an outlet for its brilliant fervour. This desire of yours to achieve political mastery of the world is the subconscious reaction of your mind seeking release from the unbearable pains of frustrated artistic desires. If you will again attune your mind to the infinite appeal of the quest for beauty, you will find happiness and the world will find peace. This world of ours has passed beyond the days when empires were worth obtaining through the blood of men, and the sorrows and privations of women and children. We are at the entrance to a new era, an era of social justice, of humanity and understanding between man and man. The door had begun to swing open when you commenced your moves for world mastery, but now it has closed fast again. You alone can cause that door, through which in the course of years will come security and happiness to mankind, to open again. Not all the thundering of the guns, the dreadful impact of bombs, the loathsome foetidity of gas, the killing, the maiming, the bludgeoning and the destruction can make the world one whit the better for your being. Nor can the horror and the starvation, the madness, grief and pestilence which must follow upon this War, bring good to you or to any human being. As an artist, Herr Hitler, you must loathe the ugliness of war and hatred. As an artist you must cherish peace and the beauty which is now doomed to destruction. I am certain that if you will come and see my plants this love of beauty, now stifled in your soul, will be rescued from its living death, and will return to health stronger than ever before, glowing with life and love and humanity. And in its renaissance you will find a new life and a new outlook, and you will find, too, that the whole world will be ready to hail you as a brother, and Hitler the Artist will have a greater name through posterity than Hitler the Dictator."

During Ethelbert's address, delivered with an eloquence which astounded the speaker himself, the Fuhrer had many paroxysms of weeping, so that the pile of handkerchiefs on his table had shrunk to very small dimensions, while the wicker basket was now commencing to overflow. Herr Hitler cleared his throat.

(To be continued)

Continued from page 51

as a parent of some of the Javanese hybrid *Dendrobiums.*

I was once offered some of these "Pinks." Naturally I was very pleased to take advantage of the kind offer. I asked "Are they Cooktown Orchids?" and the indignant reply was—"Certainly not, they are very different!" My hopes were very high till I received a parcel of very fine plants of *Dendrobium Phalaenopsis*, the blooms of which were very dark. Now I am wondering how many people really know their colours.

---

* F. M. Bailey records the genus *Thelymitra* for Queensland, describing the flowers as being blue, purple, red, yellow, or white in colour.—Hon. Ed.

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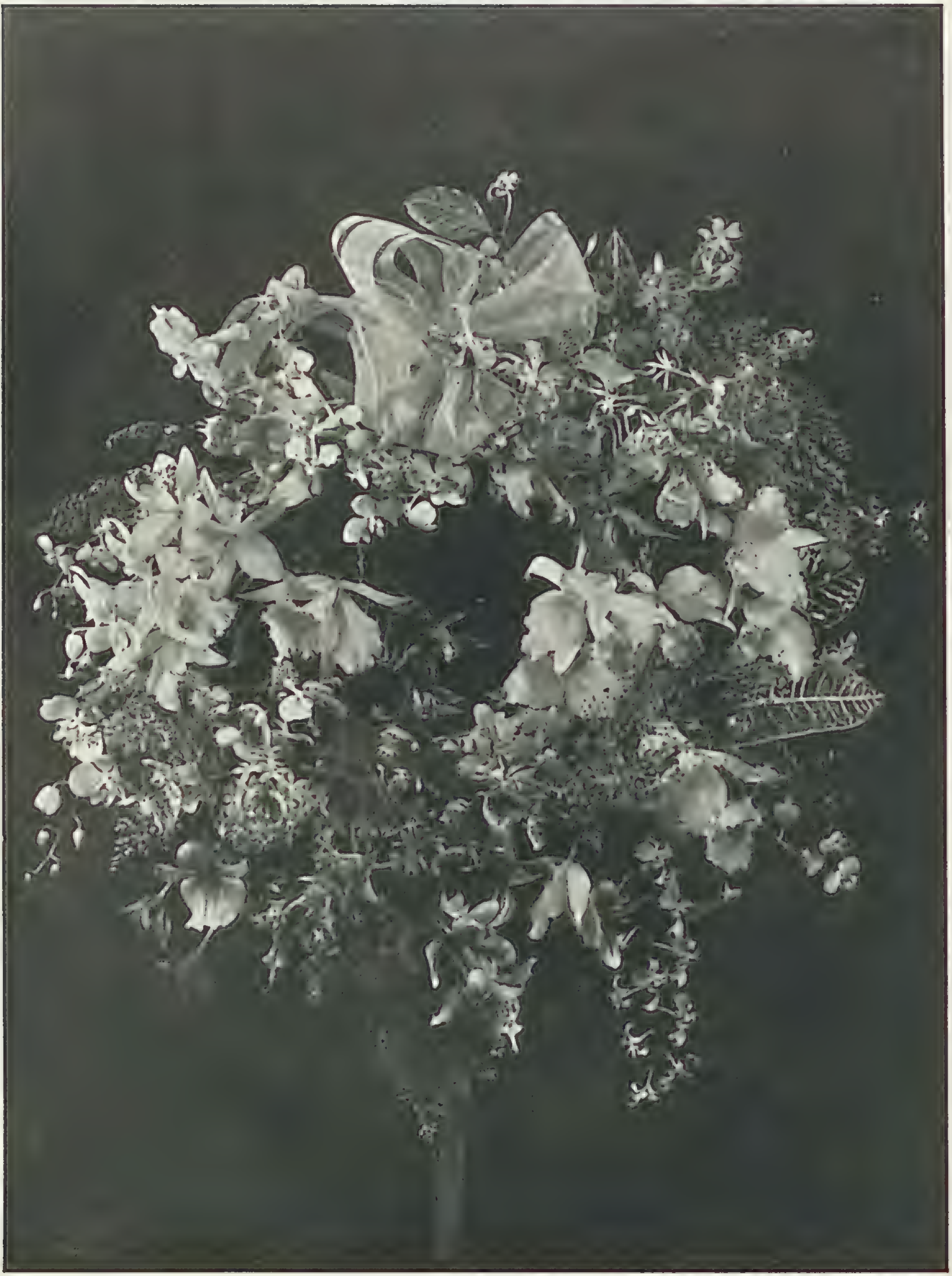

A WREATH OF ORCHIDS

For Description see page 66

Australian Orchid Review

Editorial

Orchid Showing and Disbudding

● Several sections of horticulture have received special attention in the preparation of flowers for show purposes. The high standard of the flowers of roses, carnations, dahlias, and many others shown, is due, in a measure, to the skilful removal of superfluous buds as soon as they are visible. The process is known as disbudding, the chief aim being to thin out backward buds so that the more vigorous ones can develop to their full capacity. As the flowers unfold, the petals are trained systematically so that they will display themselves to the best advantage, and by the time the flowers reach maturity they approach in perfection, in some degree, the horticultural standard of the particular section.

So far as is ascertainable, the Orchidist has not practised the art of disbudding or preparing flowers for show intentions, in anything like the excellence consonant with that of his brother horticulturists. The arrangement and care of his flowers lack the niceties of attention that mark the enthusiasm of carnation specialists, for instance.

Judging from exhibits shown at recent trade shows, no particular interest was taken in making the flowers more attractive to the onlooker. Many spikes of *Cymbidiums* that should have been tied up securely to display their flowers to the judges and the public, were hidden away in the foliage, or were drooping in such a manner that the spikes had to be raised by hand to view them. Prominent labels showing the names of the varieties were conspicuous by their absence. The names on exhibits make a show considerably more interesting to the public, a number of which was seen, notebook and pencil in hand, vainly endeavouring to list the names of desirable kinds to grow. Again, a good deal of the judges' time was taken up in re-arranging exhibits to display the flowers and make comparisons.

At one show the judges had occasion to place a dozen or so *Cymbidium* plants in a room where daylight could fall upon the flowers. It was observed on some spikes of very handsome flowers that water had been allowed to remain after watering, it was presumed, which developed transparent spots, invisible under electric light, but perfectly plain in natural light. For show purposes it is suggested that buds should be kept completely dry from the moment they are discernible, as that will obviate any spotting to sepals and petals. Excessive humidity which may be followed by sudden changes in temperature should also be avoided.

The improvement that can be brought about by disbudding Orchid plants has been the subject of experimentation over the past two years. Disbudding can be advantageous in at least two ways, the more important probably being fewer but larger flowers, and relief to a plant by preventing over-production. The better display of flowers can also be claimed where the disbudding is carried out judiciously, while the surer maturation of capsules that have been hybridised seems obvious.

In disbudding Orchids it is necessary to remove the bud as soon as it is formed, because, if it is allowed to remain on the stalk until it attains some degree of development, it seems to become fixed so far as the ultimate size is concerned, and it makes no apparent difference to those left on the stalk, whether a large bud is taken off or left on. Disbudding must, therefore, be carried out at the earliest possible opportunity while the bud is in the embryonic stage. When the scape of a *Cypripedium* carries two buds remove the backward one. If a *Cattleya* shows four buds on a spike, one being smaller than the others, take it off. It is requisite to open the sheath to do so. *Cymbidium* spikes can be manipulated to increase the size of the flowers, and to display them more effectively, the same applying to *Dendrobiums*.

Cymbidiums

GORDON SMITH, *Brisbane, Q.*

● This genus of Orchids has short, stout pseudobulbs, sheathed with long, narrow leaves. In their native state they usually grow on the trunk of a tree, where their freely-produced, long, fleshy roots have plenty of room for development. The flower spikes are produced from the base of the pseudobulbs. Their distribution extends from Eastern Australia, through the Malayan Archipelago to Burma, India, China and Japan. Most of the species from Burma and India produce large blooms, but the Australian and Malayan species do not appeal so much to the grower, for they produce small, dull coloured blooms. The blooms of *Cymbidium giganteum* and *C. grandiflorum* are probably the largest, often being 4 to 5 inches across.

Light.—Cymbidiums do best in a position where they get the fullest light short of direct sunlight. Under a tree, as long as there is protection from both the sun and wind, is an ideal position. A house that is too dark can be harmful to the plants, and for this reason I consider "light" to be most important.

Water.—During the growing season, the plants require plenty of water, but care must be taken when the flower spikes appear, as overwatering at this period is apt to bring disaster. During the winter keep the compost damp, for if the plant is left dry for long it will drop its leaves.

Compost.—The roots are long, fleshy and freely produced. They, therefore, require ample pot room for development to give the best results. A good open compost with ample drainage is necessary, so that the compost will not become sodden. Various composts are used successfully by different growers, and, while I do not condemn any of them, I do say that it is wise to find out which compost suits your own conditions. Composts as used by southern growers do not appear to suit my conditions, yet it must be admitted that *Cymbidiums* grow better in the colder climates, such as Hobart and Melbourne, than here. This is probably due to our long summer, as the plants do not get the required rest period. I have got the best results from the following compost: 1 part of osmunda fibre, ½ part of she-oak needles, ¼ part each of coarse creek sand and cow manure.

There only appears to be one scale which attacks the *Cymbidium,* and an occasional spraying with "Alboleum" and nicotine sulphate will keep this under control. The greatest trouble that the grower has to overcome is "black spot," and this appears to me to be an indication that the plant is not being correctly grown. I put forward two reasons for it. 1.—A house that is too dark will produce this condition. I have seen plants so affected moved to a more suitable position and in time the "spot" has been grown out. 2.—Bad drainage, causing sodden compost, or a heavy compost that holds too much moisture will very quickly bring about this condition, for while *Cymbidiums* like plenty of water, their root system will soon perish in a sodden mass of compost, and it takes a long time to persuade them to put out new roots after such treatment, in fact, they generally die.

This genus can, on the other hand, show its appreciation when grown under the correct conditions. Often you will notice that the short outside leaves burst. This appears to me to indicate that the pseudobulbs are making more growth than originally intended, and is, I consider, a very welcome sign.

Considering the small number of good species in this genus, it is really remarkable what a large number of very attractive hybrids are available to-day. This has, of course, been brought about by crossing the species, then crossing the species and the hybrid, and, finally, by crossing the hybrids themselves. The blooms are produced on long spikes and last in perfection for many weeks, in fact, few Orchids can surpass the *Cymbidium* in lasting qualities. Some of the blooms, such as those of *eburneum,* are delightfully scented. The *Cymbidium,* I consider, forms a very necessary part of any well-balanced Orchid collection.

● At the Eighth Annual General Meeting of the Orchid Society of New South Wales, held on Thursday, September 24, 1942, all the officers of the preceding committee were re-elected with the exception of Mr. D. Adamson who retired the vacancy being filled by the election of Mr. C. Cambourn.—See A.O.R. Vol. 6, No. 4.

Dendrobium Phalaenopsis

V. W. A. MOLLER, *Brisbane, Q.*

● It is with a certain amount of pride that I have chosen for this paper our beautiful Queensland native Orchid, *Dendrobium Phalaenopsis*, commonly known here in Queensland as the "Cooktown Orchid," and which is the official emblem of the Queensland Orchid Society.

Probably I may be regarded as biased when I say that *Dendrobium Phalaenopsis* is one of our most beautiful Orchids, but if you can only just imagine that its habitat is situated in the heart of some inaccessible jungle in South America, you would no doubt treasure this Orchid much more than you do to-day.

I am a Queenslander, and am very proud of this particular species, and feel sure you all must be too, as without doubt a mass display of *Dendrobium Phalaenopsis* in full bloom is a sight one can enjoy.

Many years ago, as a lad, I was very keen to procure a plant of this species, and was even told it was growing on box trees along a gully at Mt. Coot-tha, and was so keen to get one that I was taken by another lad to the mythical habitat. We were approaching this "spot" along a gully on the slopes of Mt. Coot-tha when I was told to look at every box tree along the gully. Finally we came to a good sized specimen of a box-tree when an exclamation came forth, "This is the tree!" But alas, not an Orchid could be seen on it, after which I was told "Someone must have taken them." Of course I was disappointed, but realised I had been made a fool of. At the same time there were indications of Orchids having grown on the tree, and probably there were some plants of *Dendrobium aemulum* one time or other having grown there.

For years and years I sought for mauve coloured Orchids until one day I was informed that they grew only in North Queensland, so naturally I gave up the idea of getting hold of any until such time that I could get someone to procure them for me. However, my first trip to North Queensland was in April, 1924, and you can just imagine how thrilled I was to see them so frequently on trees in private gardens, but still I was not able to contact anyone who could get to the source of supply, west of the Cooktown district.

Later, one day in Cairns, I saw several clumps of *Dendrobium Phalaenopsis* which were only freshly tied on trees in the grounds of "Hides" Hotel, which were a mass of flowers.

As I stood and admired these from the footpath a friend came along, so he invited me to have a refresher, and naturally my one thought was not the "drink," but the Orchids. I enquired where I could get in touch with a person who could get them for me, and was told that Mr. Newman, a commercial traveller, got those from Cooktown, and if you could get hold of him no doubt he would get them.

A few days later Easter came along and I went to Kuranda to spend the four days, where I met the famous Mr. Newman. I can assure you I lost no time in asking him about the Cooktown Orchids, *Dendrobium Phalaenopsis*, and he said, "I had a sugarbag full of them and gave most of them to Hides Hotel, and the rest, excepting a few, I gave to Mrs. Fitzpatrick here. Anyway, the few I have left you can have, and when I go to Cooktown again I'll get some more for you."

Just imagine how I felt—the proud possessor of Orchids I had coveted for many years—and later I got my first sugarbag full for 10/-. When I got them to Brisbane the next job was to look after them, as I thought, so I carefully potted them in three inch pots with a compost of staghorn (not elk-horn) peat and a drainage of broken crocks. I placed them along a ledge in line around three sides of my fernery, always giving them plenty of water, and of course they were in a nice shady position. The result was that next season I had a glorious show of blooms, but after the flowering season my poor *Dendrobium Phalaenopsis* died, having made no attempt to grow; but through over moisture and lack of sunshine, I found that they had been rotted through.

In course of conversation with our first President (Mr. E. J. Beard) he told me that they wanted all the sunshine I could give them, as he had met with a great deal of success by fastening them on to laths on the outside of his Orchid house by means of staples used on fencing wire, so I carried out these instructions, and although it improved matters I still did not get the same results as Mr. Beard.

Altitude, atmospheric conditions, and location play a big part in the successful cultivation of this species of Orchid, so I made up my mind to study the conditions and treatment by various people in scattered places throughout the coastal belt of Queensland, to see if I could apply with the same degree of success, treatment and situation. Take for instance Charters Towers with an altitude of 1008 feet and 83 miles west of Townsville, where a dry and somewhat bracing climate exists. I found *Dendrobium Phalaenopsis* placed in a hanging basket of wire netting filled with bits of charcoal and mostly pieces of decayed wood with a sprinkling of elkhorn peat, growing remarkably well suspended near the roof of a summer house adjoining the Crown Hotel. There they grew and flowered profusely year after year, so that decided me to treat mine likewise, but strangely enough that had not the slightest effect in attaining the same results as at Charters Towers.

Up in Port Douglas facing the sea were two large mango trees with clumps of healthy plants flowering with long racemes of bloom every season, and along the water-front at Cairns, on mango trees also, were fine specimens always to be seen. Yet I have tried them on trees facing the sea at the Tweed, but this proved fatal, as it seemed that the salt atmosphere there burnt them and evidently is more heavily laden with salt than inside the Barrier Reef. On another occasion I visited Mr. Fleming's home at Edge Hill, a suburb of Cairns, and there I saw wonderful specimens of these Orchids literally running wild on lemon trees, the roots being not inches, but feet, or, perhaps, yards long in some cases.

Some time back I told our Secretary (Mr. Harveyson) what I had seen, and he said that he certainly would give that a trial with some of his "dud" plants, and later he told me that they had "gone mad" on the lemon tree, and he was going to plant more on it. Recently I paid a visit to Mr. Harveyson's home and when I arrived there he was decorating the remaining portions of bare stems on the lemon tree with *Dendrobium Phalaenopsis, D. bigibbum,* and *D. superbiens;* as the results were so convincing to him that he decided to use every available space, and where there was insufficient space he was trimming the foliage and lemons off to make room for his Orchids. Believe me or not, but it is fairly safe for me to say that he thought more of the welfare of those Orchids than the fruit.

When I was living at Kenmore I met with fair success growing *Dendrobium Phalaenopsis* on the rough bark of the "gum-topped box," and latterly I placed in a native shrubby tree a few apparently useless plants, forgetting all about them until the next flowering season, and there they were blooming from new growth made on this particular tree. On examination I found that the roots were running wild all over the thin stems and growing remarkably well. The wood seemed a similar kind to those in the district where *Dendrobium Phalaenopsis* is found in abundance west of Cooktown, North Queensland.

About three years ago, Mr. Alex Grant, of Mackay, built a glass-house, potted a number of these Orchids in osmunda fibre and polypodium fibre, and placed them on the benches to try his luck with them. At the time I did not think they would do any good, and twelve months later I visited Mr. Grant to find that all his *Dendrobiums* had grown remarkably well with a good show of blooms, but I expressed the view that the growth would not be sustained, and gradually they would go back. This was the opinion of all who saw Mr. Grant's house, but to my amazement, last year when I was in Mackay, the growth and profusion of blooms of *Dendrobium Phalaenopsis* was a sight worth going a long distance to see. A movie of that flowering was shown here last August, but did not give justice to the actual reality.

Last April again I went to see that wonderful sight, and found that the growth had even increased, one bulb measuring 3 feet 3 inches, and the sprays of blooms were so long that they carried up to 18 and more flowers, some of which were up to 2½ inches across.

Mr. Grant informed me that he found most success with potting in osmunda fibre only, but there again I doubt whether the same treatment here would be successful. Mr. C. Graham, of Mackay, was unsuccessful in glass-house cultivation of this species.

With all these variations of atmospheric conditions and treatment, it seems to me that it is all a matter of experimenting in each particular locality, as there appears to be no set practice to be followed for the successful cultivation of this glorious Orchid. This statement, of course, is only my opinion and perhaps there may be many who could give a much more interesting paper on *Dendrobium Phalaenopsis,* which I hope will be forthcoming.

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A Talk on the Genus Cypripedium

C. A. HILSDEN, *Brisbane, Q.*

The genus *Cypripedium,* more commonly called "The Slipper Orchid," on account of the shape of the lip or pouch of the flower, may be considered an interesting and ideal variety for culture by amateurs. By commencing with the natural species until a full understanding of their requirements is obtained, the grower may extend his activities to the more valuable hybrids. Although described as a terrestrial Orchid, that is, one that grows in the ground, there are a few varieties that grow on trees and rocks. The plants have no psuedobulbs to store moisture, and rely on their fleshy roots for sustenance, which they find in the crevices of the bark, between the rocks, and amongst the humus formed by fallen leaves, etc. Their handsome dark green, and, in many cases, mottled foliage, makes them ideal subjects for pot culture.

They possess a wide range of distribution, as varieties are found in regions from England and America, through the islands, India, Malaya, and China. As they are mostly winter flowerers, their flowers are very welcome at a time when other flowers in the bush- or glass-house are scarce. Few other flowers possess the lasting qualities of the *Cypripediums* as they will retain their beauty for several weeks either on the plant or as cut flowers. The conditions under which they thrive best may be described as cool, moist and shady. Some of the mottled leaved varieties such as *callosum, Curtisii, barbatum, bellatulum, Chamberlainianum,* etc. need warmer treatment than the plain leaved varieties such as *insigne, villosum, Charlesworthii,* etc. By shady conditions, I do not mean that they should be grown in a dark corner of the bush-house, as they require good natural light, but well shaded from the direct rays of the sun.

During the growing season the atmosphere surrounding the plants should be kept as moist as possible, the pots and benches being sprayed or hosed during the hot days. This, of course, also helps to keep the temperature down and provides a nice moisture laden, cool atmosphere around the plants; spraying overhead is beneficial for the same reason, and, at the same time, washes any dust off the leaves and keeps the foliage clean and bright. During the winter the quantity of water should be considerably reduced, but do not allow the plants to dry out entirely, as the absence of pseudobulbs does not allow the plant to store any moisture.

There seems to be a difference of opinion between growers as to the respective merits of bush- or glass-house treatment of this genus. After many failures in a battened-in bushhouse with battened roof (of course, one will have failures in all types of houses), I am of the opinion that a cool glass-house with ample ventilation is most suitable for their culture. Under glass, the temperature is easier to control and is not subject to the sudden changes of temperature due to outside influences. Shading also is easier to regulate.

Being essentially a subject for pot culture, the pots selected should be of a reasonable size to allow of root growth without over-potting; as over-potting is not only a waste of compost and space, but causes the compost to sour more quickly than when the roots are able to penetrate through the available compost, as by this means, fresh air is admitted which helps to keep the compost sweet. It is also beneficial to enlarge the drainage hole of the pot, as good drainage is very important to the successful culture of the genus.

We now come to the question of compost. Many growers, and successful ones too, advocate many and varied mixtures, such as tanbark, leafmould and manure, polypodium peat and fibre, sand and manure, etc. While not condemning any particular compost, one must aim at providing a mixture that will meet the requirements of the various species, and at the same time, agree with the local conditions under which the plants have to grow. The compost should be of such a nature that will allow the perfect drainage of surplus moisture, while retaining sufficient to keep the roots moist. A compost I have found to be suitable is composed of equal parts of osmunda fibre (cut to the size of a walnut) teased polypodium peat, pine needles cut to lengths of three-quarters of an inch, adding about one-fourth part of medium coarse sand, or broken brick.

For some species such as *insigne* and varieties, a little broken cow manure may be added with advantage. Varieties such as *callosum, barbatum, bellatulum, Farrieanum, niveum,* etc., which grow in limestone country, old lime mortar or coarse shell grit should be added to the compost.

The compost should be of a fibrous nature, having the dust sieved out of the fibre and peat, to prevent it from washing down amongst the crocks, and interfering with the drainage. Before potting, the pots should be soaked until they have absorbed all the moisture they can. Cover the bottom of the pot with pieces of broken crocks set on edge, and then place some osmunda fibre or spahnum moss over the crocks. Fill the pot with compost, and set the plant so that the crown rests on top of the compost. Be careful not to set the plant too deep, as the growing eyes will then be covered and "crown rot" will occur, with the eventual loss of the plant. The compost should be slightly domed to the centre of the pot, thus allowing the water to run to the sides. The compost should be packed firmly around the plant, and the crown of the plant should be level with the top of the pot. To obtain a good specimen plant, it is better to plant two or more growths together in one pot, than to persevere with single growths, at the same time, planting the growths with the leaves growing in the same direction.

Apart from slugs, which will attack any plant, the worst pest that attacks *Cypripediums* is thrips. This insect sucks the sap from the leaves until the whole plant is exhausted and dies. Being so small as to be almost invisible to the naked eye, and multiplying rapidly under favourable conditions, much harm is done before the tell-tale yellow marks are noticed on the leaves.

Regular and frequent spraying over and under the plants and benches in the warmer weather will do much to counter these pests. As soon as any signs of these pests are noticed, a good spraying with nicotine sulphate (1oz. to a gallon of water) or "X.L.All" should be given, and repeated after an interval of two or three days. Make sure that the under sides of the leaves receive a thorough spraying, as the insects live and work on the under sides of the leaves.

After watering the plants avoid as far as possible any water remaining in the centre of young growths, as it has a tendency to rot the young growths.

The much discussed subject of manuring these plants I prefer to leave to the discretion of the grower. Undoubtedly these plants, growing naturally, receive a certain amount of fertiliser through Nature's channels. But other aspects such as rainfall, heavy dews, sunshine, etc., considerably reduce the strength of this natural fertiliser. If the plants are grown under satisfactory conditions, very little fertilising should be necessary. But when a plant shows the first sign of a bud, then a weekly application, or dip in a weak solution of cow manure, sheep manure, or other fertiliser, strengthens the bud and the stem, and nourishes the developing flower. As soon as the flower opens, there is no further need to continue the use of fertilisers. As the plant will benefit with less watering after flowering until new growth is formed, it is obvious that continued use of fertilisers would be harmful to a plant that is not in a condition to absorb them.

The treatment of hybrids is very similar to the general treatment as outlined in these notes. They are in most cases as easy to grow as the species, but as they show a distinct improvement in beauty of shape and the colour of the flower, they will repay one for any special attention. The grower will be guided by the parents of these hybrids for any particular attention.

On receipt of freshly imported plants, it should be remembered that these plants have not received any water for a considerable period. Therefore, on arrival, they should be lightly sprayed with clean water, potted up, and placed in the moist atmosphere of the glasshouse. A light overhead spraying may be given when the leaves recover their natural freshness, and as root growth becomes evident water may be given more generously.

Finally, I would emphasise that, as with all genera of Orchids, no set rules can be laid down that would suit all conditions and localities, but, if the general rules as outlined in these brief notes are followed, then the grower should enjoy a fair measure of success, and be rewarded with strong growing plants that will flower regularly.

● In the May number of the *Victorian Naturalist* Mr. W. H. Nicholls described two new species of Prasophyllum for Victoria. Both came from the Portland district. *P. diversiflorum* is a tall, moderately robust plant with variable flowers, green with red-brown markings. *P. Beauglehole* belongs to the "pygmy" section *Genoplesium*, and Mr. Nicholls identifies it with Hooker's Tasmanian *P. nudum*, which is illustrated in his *Fl. Tasm.*, vol II. Hooker's name is invalid, as he had previously bestowed it upon a New Zealand plant which is really a different species. It is now named after its Victorian discoverer, Mr. C. Beauglehole. Curiously, this species turned up about the same time near Mount Irvine in the Blue Mountains of N.S.W., where it was found by the Misses J. and G. Scrivener.

Cool House Culture and Notes for Amateurs

T. H. JAMES, *Hazelbrook, N.S.W.*

● The summer season, which is the main growing period for most of our Orchids, is again with us, and there is little else to do except provide water, attend to light and ventilation, and guard against insect activities.

I have been growing Orchids now for many years, and have experimented in many directions, and my experiences have inclined me to the belief, or rather, I should say, conviction, that the compost used is not the vital matter for which it has been claimed, but that light, air, and water are much more important. One particularly successful grower has repeatedly voiced a similar belief at meetings of the Orchid Society of New South Wales. By this statement I do not mean that a *Dendrobium* or a *Cattleya* should be grown in soil, or a *Cymbidium* in fibre. One of the first essentials is to ascertain the natural habits of the various species, and the conditions in which they grow, and endeavour to reproduce them as closely as possible. To do so absolutely is not possible, or rather, I should say, is not practicable, as it would involve the building of a number of separate houses. For most types of Orchids the compost used should, I consider, be open and moderately absorbent, and the container well drained. Such would permit copious watering without any possibility of the compost becoming soggy or sour. If these factors be provided the materials do not seem to matter particularly. I believe that I mentioned in a previous article that I found no difference in the use of black or brown todea for *Cattleyas* or *Dendrobiums,* and the latter grow equally well on a piece of hard fibre or slab of tree-fern trunk. The really important factors are water, light and air. Given abundance of air and water I have found that *Cattleyas, Dendrobiums* and other sun-loving Orchids appreciated almost full sunlight during the growing period.

Watering seems to be a problem to many, largely due to lack of sufficient ventilation, and/or a compost which is either insufficiently drained or contains too much material of a moisture retaining nature. My own plants are watered both in the morning and evening during the summer, but particularly in the evening, and the hose, when its use is permitted, is played freely over the foliage and flowers. On very hot days the foliage is sprayed several times whenever practicable. One important feature of this free watering is that, for some time after, the door and every ventilator should be kept open, particularly after the evening watering. In a closed house dampness or rot might develop. In a discussion at a recent meeting of the Orchid Society of New South Wales on the question of the overhead watering of *Cypripediums,* some members contended that such would induce the rotting off of young growths, and urged the application of water to the pots only. Others, whose results are excellent, always water overhead. Personally I have never yet lost a growth from overhead watering. Another point discussed was the use of a compost that would be sufficiently retentive of moisture to permit of less frequent watering.

In connection with this question, there is one particular point I wish to emphasise. Growers must definitely study their own house conditions and be guided thereby. It would be foolish to water indiscriminately any Orchid in a compost which contains sphagnum moss, or similar moisture retaining material, or without ample ventilation. Sourness or soggy conditions would soon develop and cause deterioration or loss of plants.

There is another aspect of this frequent and overhead watering during the hot weather which appeals to me. In a state of nature many Orchids are subject to heavy and continuous rain during the growing period, but the roots are not enclosed in pots, etc. Frequent watering would, therefore, in the conditions I have outlined, maintain a moist compost without real wetness and would, I think, regularly aerate it with beneficial results. Further, the foliage would be kept clean and thus better able to perform its natural functions and mitigate the occurrence of thrips, etc.

Cattleyas.—I have found that when the leaf has just passed out of its protective sheath, watering should be reduced, but maintain a spraying of the foliage until the flower buds appear. Then renew the watering until the buds are about to open. Endeavour as far as possible to prevent second growths. This may not harm the plants, but I think definite rest would be beneficial. Some species will not flower at all unless they get a definite rest, such as *C. gigas* (Warscewic-

A section of Mr. Grant's glasshouse with Dendrobium Phalaenopsis ("Cooktowns") in bloom. (*See page 57*)
Photograph by S. R. Brock, Mackay.

zii), and *C. Gaskelliana.* I have been unable to prevent many of these second growths myself, and whilst they are generally smaller than those from which they sprang, they mostly flower and have not affected the new spring growths. A little peat moss on top of the compost will, if the conditions are favourable, induce the spread of a fine dark moss the spore of which is rich in Vitamin B1.

Watch for that small white scale which is so partial to the dormant buds at the base of the bulbs which, if not checked, will wreck them. It also breeds freely underneath the bulb sheaths. Also watch those sheaths and if they become black, particularly at the base, remove them at once as there is moisture behind them which will rot the buds. A small camel-hair brush is useful for probing behind those dormant eyes for scale. If that scale is about or the plants are liable to attack by thrips, regular spraying with such as Pestoxol will keep it in check. In the conditions I have described in these notes thrips could not exist.

Dendrobiums.—I would suggest that, if practicable, as many as possible should be placed in the bush house, or better still, in the partial shelter of trees if a suitable location is available. I have several species growing on trees here which have withstood the frosts and cold of three winters, and also three years of drought. They certainly have not prospered but they are still alive and occasionally produce flowers. A few *D. Wardianum* and *D. thrysiflorum* which I gave a neighbour twelve months ago and which received a certain amount of attention have grown well on a Jacaranda tree. I have given my plants an occasional application of weak liquid manure to which they appear to have responded.

Thunias.—These will now be developing their flower spikes, and should have plenty of water, and an occasional supply of liquid manure. When the flower spikes emerge place the plants under cover as rain or wind will quickly spoil the flowers.

Cymbidiums.—The disease which has been affecting *Cymbidiums* here for some time past came up for discussion again at a recent meeting of the Orchid Society of New South Wales. A grower suggested the possibility of an earth grub attacking the roots at the base of the bulbs and, by either injecting a virus or stopping the flow of sap by biting the outside tissue of the roots, ultimately killing them. Personally I have never heard of a grub which sucks or injects virus, nor have I ever noticed any affected roots showing signs of biting, but I confess I have never examined them for that purpose under a microscope. However, this aspect will be further examined. Experiences of some growers seem to suggest two types of this disease. Both appear identical in their effect on the plants but in some cases the plants readily respond to repotting in fresh compost of a light open nature, whilst in other cases no treatment of any kind prevents the spread of the disease and the ultimate death of the plant. All plants in my collection which became affected readily responded to repotting, but I noticed that in every case the compost had for some reason become soggy. Whether this was the cause or result I am not prepared to say, but am inclined to think it either was the cause or was a contributing factor.

Keep the water going freely until the end of February or early in March when I believe somewhat drier conditions would assist in the production of flower spikes. I am still firmly convinced that plenty of sunlight is the greatest aid to free flowering. Even in full sunlight all day they will not burn if kept moist, but hot winds will cause much damage.

Cypripediums.—I would refer to my comments in the early part of these notes on the question of watering.

Periodically I examine the drainage holes at the bottom of the pots and will occasionally notice that the compost appears to have worked down. This is generally a sign of worms in a pot. Emersing the pot in water to which a little lime has been added will cause the worms to come to the top. Worms quickly render the compost soggy, and it would be better in many cases, particularly with small plants, to repot in fresh compost. A soggy compost will quickly injure the plant.

My own plants have, for the past two years, received more light than previously and this, I believe, has contributed to a better growth and has reduced the unweildly length of leaf common to some varieties such as *Harefield Hall.* Species such as *Lowii* and *Haynaldianum* which grow on the tops of trees require plenty of light and a warmer situation in the house.

Phaius.—I would again urge growing this genus outside among the Cymbidiums. The growth would be shorter and more sturdy than under glass house treatment. As they are practically swamp plants they require plenty of water. Old sacking around the pots assist in keeping the roots cool on hot days. I have found *P. Wallichii* the most satisfactory. It flowers freely, and has not that annoying habit of self-fertilising its flowers which then die in a few days.

Miscellaneous.—For those who have but recently started the growing of Orchids — and there are many—the following can be grown successfully without a heated house in addition to those dealt with above.

Coelogyne cristata and *Zygopetalum Mackayii* do best outside with *Cymbidiums,* and *Oncidium varicosum Rogersii* (particularly good), *Oncidium flexuosum, Odontoglossum grande, Lycaste Skinneri, Miltonias* (creeping rhizome types), in a cool glass-house or bush-house.

(Miltonias with the cluster type of bulbs have been a failure with me).

General.—The transfer of my plants from sea level to an elevation of 2300 feet here in the mountains has thrown many of them out of their usual routine. Many *Cattleyas* held back their flowers for four months and some Orchids have not flowered at all. As most of the Orchids we grow are from high altitudes, I am hoping that ultimately mine will do even better here than in Sydney. Points that I have noticed are that the flowers last much longer here. *Cattleyas* have lasted six weeks, and *Dendrobium nobile* a similar period. Also the colours are more intense.

DENDROBIUM FALCONERI
Grown and photographed by G. Cruickshank, Clovelly, N.S.W.

Caladenia Fitzgeraldii, *nomen novum*

H. M. R. RUPP, *Northbridge, N.S.W.*

● This *Caladenia,* belonging to the group widely known throughout the southern areas of the Commonwealth as "Spider Orchids," is figured by Fitzgerald ("Australian Orchids," Vol. 1, part 2) under the name *C. clavigera* Cunn. He observes that there are discrepancies between it and the form figured by Hooker in his "Flora Tasmaniae," vol. II, as Cunningham's species. As a matter of fact, the discrepancies are too great to allow the inclusion of these plants in one species, and there can be no doubt that Fitzgerald has not depicted Cunningham's *C. clavigera* at all. W. H. Nicholls has demonstrated this in the "Victorian Naturalist" for December, 1941, where he also identifies Cunningham's plant with the late Dr. Rogers' *C. cordiformis,* the latter name thus becoming invalid. In the same journal for April, 1942, I have proposed that Fitzgerald's so-called *C. clavigera* in future be known as *C. Fitzgeraldii.* There appears to be some difference of opinion on the point whether this change of name should involve a new description. Personally I do not think it should, as Fitzgerald's plate fulfils the requirements of the International Rules of nomenclature, and I have only substituted another name for the one which he erroneously attached to it. However, in order to satisfy possible objections, a description is here appended.

Planta gracillima, 14-30 cm alta, folio hirsutissimo. Flos plerumque solitarius, flavoviridis. Sepala linearia et filamentosa, clavigera, Sepalum dorsale 3-4.5 cm longum, erectum, cum vena rufa. Sepala lateralia latiora longioraque, similiter venosa. Petala breviora, filamentosa. Labellum indivisum, ovato-acutum, recurvum, probe basem flavum, prope apicem rubrum: margines prope basem fimbriati, prope apicem crenulati. Laminae calli flexi, in ordinibus quatuor, vix post labelli medium extendentes. Columna incurva: alae prope apicem moderate latae. Glandes ad columnae basem globosi. Anthera fere acuminata ;rostellum fere obsolescens; stigma ovatum.

A very slender plant 14-30 cm high, with a very hairy linear-lanceolate leaf. Flower usually solitary, prevailing tint yellowish-green. Sepals linear-filiform, conspicuously clavate. Dorsal sepal 3-4.5 cm long, erect, with a reddish vein along the median line. Lateral sepals broader and longer, spreading or deflexed, similarly veined. Petals shorter, filiform. Labellum undivided, ovate-acute; basal portion yellowish, anterior portion deep red: margins along the posterior half fimbriate, then crenulate to the tip. Laminal calli of the golf-stick type, flat-topped, in 4 rows hardly extending beyond the middle. Column incurved (but not strikingly), its wings moderately wide towards the apex; the two basal glands globular. Anther almost acuminate; rostellum obscurely developed; stigma ovate. Fitzgerald's plate in Austr. Orchids, 1, 2, may be taken as the type.

The flower differs from Cunningham's *C. clavigera* in the following important respects: in the latter, the "clubs" of the sepals are frequently lacking, and even when present, they most commonly take the form of small globular glands at the extreme tips, and are seldom enlongate. The labellum is *trilobate,* the lateral lobes varying considerably in dimensions, but often being so wide that the whole labellum is broader than long. Their margins are quite entire. The margins of the narrower mid-lobe are either entire or very minutely and irregularly crenulate or serrulate. The column is so much incurved as to become almost semicircular in profile, and its wings are widely expanded above. The rostellum is small but distinct.

The distribution of *C. Fitzgeraldii* is imperfectly known; but it undoubtedly extends from N.S.W. into Queensland on the north and into Victoria on the south. I have collected it personally on the Upper Hunter River above Scone. Judging from a considerable number of specimens examined from different districts, it exhibits few and slight variations from the type.

● To help the Red Cross Society, Mr. John Bisset, in conjunction with Messrs. David Jones and Co. Ltd., organised an Orchid Exhibition, which was held in David Jones' Auditorium, Sydney, from September 30 to October 2, 1942.

Various activities in operation at the Exhibition raised the magnificent sum of £218. Ladies from the Red Cross Society supervised the collections of funds, while the co-operation of members of the Orchid Society of N.S.W. helped considerably in making the Exhibition a success. In the aggregate the quality of the competitive flowers shown—especially *Cymbidiums*—was of a very high standard.

Potting

F. A. FARR, *Brisbane, Q.*

● For *Cattleyas* and *Dendrobiums* I use the same compost, viz., osmunda fibre and polypodium. Perhaps my method is different from others in so far as the osmunda is chopped up finely, and the polypodium well teased and mixed with the osmunda. I do not remove the dust from the polypodium, as I think the dust may have a certain amount of food that is beneficial to the Orchid. Before chopping the fibre, it is washed thoroughly and cut when wet. By doing so it does not "splash" all over the place, and if the chopping block you happen to be using is placed in the centre of a piece of hessian, the fibre can easily be retrieved. This method may seem to take a time to prepare, but you will benefit by the fact that it is much easier to pot when these instructions have been carried out, as the compost is easier to manipulate around the root system, and, finally, a much neater job is achieved. Also this type of compost will prove beneficial when it becomes necessary to repot the Orchid, as the plant can be lifted out of the pot and, when placed under a tap, the old compost will come away quite easily, and the root system will not be disturbed.

To finish off after potting, I use a pair of grape scissors to trim the ragged edges of the fibre, and this leaves quite a nice, neat pot, which, apart from being beneficial to the plant, always presents an attractive appearance. The pot is at least half-filled with broken crocks in an upright position for drainage, and the compost packed tightly around the roots of the plant. To enable my compost to be packed firmly, I use a potting stick, which, in my opinion, is very necessary, as the compost cannot be packed sufficiently tight by merely using the thumb or fingers, and very seldom do I find it necessary to use a stick to hold the plant in position once the potting process has been completed.

I have witnessed several potting demonstrations kindly given by other members, and I do not entirely agree with their methods in the case where baskets are used, as, in my opinion, pots are more practicable, as they can be placed upon benches filled with ashes or gravel and kept damp, whereas baskets have a tendency to dry out too quickly, unless they can be attended to each day. I find the pseudobulbs soon become shrivelled, and look most unhealthy, and in lots of cases lose their live eyes on the back bulbs. Back cuts are most useful these days when new plants cannot be imported, and we do not want to lose those we have.

Phalaenopsis.—I must contradict myself a little when it comes to *Phalaenopsis,* as I consider this type of Orchid should be planted in a basket, and I think the compost should be different for these plants. Some pieces of old (nearly decayed) wood should be placed at the bottom of the basket, and the bulk of the compost should be polypodium and sphagnum moss, with one or two pieces of cow manure. Also with a topping of cow manure. I have seen plants growing with nothing else but decayed cow manure, and the results are outstanding in comparison with other plants planted in the orthodox compost (osmunda and sphagnum). However, this is a matter for the grower, but I would suggest that you try at least one plant in the compost I have suggested, but keep in mind the compost must be damp at all times, as *Phalaenopsis* like water, and it is my contention that you cannot give them too much. In some cases I have noticed growers using a bottle filled with water hung over the plant with a tape leading from the neck, which allows a continual seepage into the compost. They should be hung 18 inches or 2 feet from the glass roof, and gradually lowered as the spikes start to grow.

Vandas.—Here again I disagree with the standard compost used for *Vandas.* My suggestion is to use a large pot, quarter fill with crocks and the balance with leafmould mixed with osmunda and polypodium with broken-up cow manure. You will notice that the roots of *Vandas* are not content to stay in the pot, the reason being that there is lack of food for them. I have seen *Vandas* with their roots growing right through the benches into the ground, where they seem to find the food that they require. I think you will find that with the compost that I have suggested, the roots will remain in the pots, and again I would like to impress upon you that *Vandas* also should be kept moist.

The above ideas were brought about through my own observations and experiments. I do not pose as an authority on Orchids, but I do think that observation and common sense will assist in bringing about the desired results. If some grower is having success with some specific plant you have been trying to grow, don't be afraid to ask him how he has accomplished the growing of the plant—such as the compost he uses, etc.—as it is only through these inquiry channels and exchange of views and ideas that we can obtain perfection.

JAMES ROBERTSON TANNER
Passed away 25th June, 1942
Hon. Treasurer, Queensland Orchid Society

● ***Frontispiece.***—On the death of Mr. J. R. Tanner, a wreath was made up by Mrs. Moses from Orchids given by several members of the Queensland Orchid Society. It consisted chiefly of hybrid *Cattleyas* and *Laeliocattleyas, Dendrobium bigibbum, D. superbiens, Phalaenopsis amabilis, Vanda tricolor, Cymbidium grandiflorum, Cypripedium Charlesworthii, Cyp. insigne,* and *Cypripedium hybrids, Epidendrums* and other small Orchids. Many described it as the most beautiful wreath they had ever seen.

Cultural Notes for Brisbane

● ***December.***—This is the period of maximum growth for most Orchids, and therefore the plants' chief needs are copious watering, ample nourishment, and much sunlight. These three factors are interrelated and are equally important. The water carries the food molecules into the plants' organs, while the sunlight is the motive power which operates the conversion of the food elements into the essential compounds. While the weather is hot and dry, watering in the early morning, again at noon, and finally after nightfall, is not too much, providing the compost is firm and sweet. Liquid cow manure and other nutriments can be given to all growing plants. Summer flowering *Cattleyas* are showing buds and sheaths, and the seasonable vandaceous plants are well advanced, particularly *Aerides odoratum, Rhyncostylis retusa* and *Vanda suavis.* The fantastic, highly coloured, overscented *Stanhopeas* should be showing for flower, and all your plants generally should be saying "Thanks for the Summer." At the same time all the pests are ready to say, "Thanks for the flowers."—J.M.C.

January.—Our plants should now be making luxuriant growths, and from these new growths will come our next blooms. If the plants receive a check it is likely that the growths will not produce blooms, or, at any rate, that the blooms produced will be deficient in quality, quantity, or form. The factors which might produce a check are (1) lack of moisture for a considerable period; (2) lack of light, or too much direct sunlight; (3) faulty or deteriorated composts; (4) sudden drop in temperature; (5) malnutrition; (6) fungoid or virus infection; and (7) attack by sucking pests. Constant attention to these points should be given. Leaf eating insects may also affect the flowering of plants by destroying or limiting the plants' power to manufacture their food. A sour, soggy compost will result in root disease, and the subsequent deterioration and possible death of the plant.—J.M.C.

● ***February.***—Summer growths will be completed this month, while those plants which make new growths in the autumn will be well advanced. When growth has been completed the gradual diminuation of water can be commenced. Liquid manuring of *Cypripediums* and *Cymbidiums* should be maintained to ensure good and numerous flowers during the winter and spring.—J.M.C.

"Old Jim"

A tribute to the memory of the late James Robertson Tanner, Esq., (Hon. Treasurer of the Queensland Orchid Society).

J. MURRAY COX, *Brisbane, Q.*

He was a man (then boldly dare to say)
In whose rich soul the virtues well did suit,
In whom so mixed the elements all lay
That none to one could sov'reignty impute;
As all did govern, yet all did obey:—
He of a temper was so absolute
As that it seemed, when nature him began
She meant to show all that might be in man.
—*Michael Drayton.*

● On Thursday, 25th June, 1942, close to midnight, there passed from amongst us the soul of James Tanner, affectionately known to the members of the Queensland Orchid Society as "Old Jim." Not that he was so old in years, for he was only 55 when he died, but he was one of those men whose innate goodness and humanity seem to inspire a feeling of brotherhood and affection in their intimates.

His death involves the Queensland Orchid Society in a great loss, for he was an ardent Orchid lover, and had been a keen and faithful member of the Society from its inception. Up to the day of his death he held the office of Honorary Treasurer and Vice-President, and no person gave greater service to the Society and its members than Old Jim. It is a source of some consolation in his loss that early this year the members conferred the honour of life membership upon him in recognition of his great services.

The son of the late William Middleton Tanner, he had lived all his life in Brisbane, and at the old Church of St. Matthew, at Sherwood, a pretty suburb of that city, he married Miss Bessie Edna Bigg, who, with their two sons, survives him. Both sons, Howard and Garth, are members of the A.I.F., Howard, alas, being one of the gallant band who fought to the last in Malaya, and whose fate is still unknown. More happily, Garth returned from the Middle East a little while before his father's death, and so helped our old friend in his anxious concern over his elder son's fate.

He was a man sincere in mind, who had a deep and abiding love of beautiful things; who found joy in the opening of a flower, in the reading of beautiful words, in music, and in the fine companionship of his fellows. He was ever ready with a helping hand for those in need, and with a quiet word of encouragement to those in doubt or trouble. Of a placid and kindly disposition, he was slow to anger and patient with those who used him ill.

The loss of such a man at the present time is a tragedy. We of the older generation of those who live in this period, when the fruits of centuries of civilisation and culture have been thrown into the melting-pot, have seen most of our cherished ideals pounded into nothingness by the dreadful blows of total warfare. Materialisation has threatened to destroy all those things which make life truly worth something. Honour and kindliness, truth and beauty, are in the discard, and liberty trembles on the brink of the abyss of totalitarianism of one brand or another. Because of these things, it is necessary for the good of future generations that there be some such men survive the cataclysm, to hand on the love of beautiful and noble things, so that they die not in our people forever.

Let us not grieve too deeply or too long for our old friend. We gained much from our association with him in life, and his passing has strengthened the bonds between us who are left.

He there does now enjoy eternal rest
And happy ease, which thou doest want and crave
And further from it daily wanderest:
What if some little payne the passage have
That makes frayle flesh to feare the bitter wave,
Is not short payne well borne that brings long ease
And layes the soule to sleep in quiet grave?
Sleepe after toyle, port after stormie seas,
Ease after warre, death after life, does greatly please.
—*Edmund Spenser.*

● Two plants donated by Mr. T. Harris, of Coolangatta, were raffled at the October meeting of the Q.O.S., the sum of five guineas being realised, which was subsequently donated to the Missions for Seamen (Merchant Navy Appeal).

● Mr. E. J. Beard was unanimously elected hon. treasurer of the Queensland Orchid Society at the meeting held on July 10, 1942.

● Membership subscriptions to The Orchid Society of New South Wales for 1942-1943 are now due and payable to the Honorary Treasurer, Mr. G. J. C. Tosi, 39 Martin Place, Sydney.

"Saying it with Orchids"

J. MURRAY COX, *Brisbane, Q.*

Continued from September, 1942, issue

"Mr. Smithers," he said brokenly, "no one has ever spoken to me as you have done, for no one has ever understood me as you do. I am a man of peace. I hate bloodshed and war. My mission is and always has been to spread peace throughout the world, and it has seemed to me that only by bringing the world under the influence of the great culture of the Germanic peoples could this, my aim, be achieved. But you are right. At heart I am an artist. In my youth those who should have helped me upon my chosen road thwarted my wishes and tried to make of me a clerk, a routine rep-tape official. They scoffed at my early attempts to express myself in colour—they blocked my efforts to enter the art school at Vienna. They threw me out into the world penniless and friendless. I struggled to live by painting—poor daubs many of these first efforts of mine—done under the worst of conditions—untaught, hurriedly, desperately—sometimes when I was so weak from hunger and despair that I scarce could hold a brush. The Jew traders who bought my pictures gave a few pfennings for them—so little that it did not suffice to keep body and soul together. I had to beg to live. They used my poverty and desperation to force me into the forging of the names of established painters upon my work, and these forgeries they sold to the unsuspecting at a tremendous profit. They killed in me the love of beauty and engendered in its place a hatred of Jewry and of commerce, and, I fear, of mankind. They murdered my art."

A violent burst of sobbing racked his form. He soaked two more handkerchiefs and then went on.

"I fled from my native Austria, which had become the hunting ground of the Jew, and came to Germany, which from that day has been my Fatherland. When Britain and France made their first attempt to debar the German people from their destined and rightful place in the sun, I was amongst the first to volunteer, and I thanked God for the opportunity of fighting and perhaps dying for my country. For five years I served, and I wear on my breast the Iron Cross which was awarded me, and on my body the scars of the wounds I received. But in my heart I bear a deeper scar, for the Fatherland was betrayed, and, though her glorious armies were unbeaten, was thrown helpless, wounded and disarmed, to be devoured by the Jewish jackals that had gathered about her. But I swore that I, Adolph Hitler, Austrian by birth but German by affection and adoption, would one day raise the broken, bruised and bloody Reich to the most exalted place in the world. The Austrian Germans have been freed from their Hebrew chains and brought into the paternal embrace of the Fatherland. The insolent and upstart Czechs have been reduced to the status of tolerated slaves. Poland has been made part of Germany forever, and, had it not been for the impudent aggression of England and her foolish dupe, France, all Eastern and Central Europe would own the mastery and rule of the third Reich. Nothing shall stop me on my path. England, France, Russia will bow beneath my might. The cowardly Italians who feared to stand with me in my need will be reduced to vassals who will tremble at my word. Holland, Belgium, Denmark shall be brought into the Reich. India, Australia and Africa, and all the possessions of the decadent and tyrannous British Empire shall be our colonies and shall have the benefit of our culture. The false and puerile doctrines of democracy shall be wiped from the face of the world, and there will be one Reich—one ruler—one God—I, Adolph Hitler."

His voice had risen to a shrill scream, and from his mouth the saliva frothed and dribbled down his chin.

Lieutenant Von Schlieper - Spittenhausen clicked his heels and "Heil Hitler!" 'd three times. Even Ethelbert Smithers was affected by the Fuhrer's frenzy and gave a hearty cheer. Suddenly the dictator slumped into his chair and covered his face with his hands.

"Not understood—not understood," he moaned, groping blindly towards the depleted handkerchief pile.

There was a poignant silence broken only by the Fuhrer's sobs. Then Ethelbert stepped forward and patted the overwrought man on the head.

"There, there," he said, kindly. "You just put on your helmet and come and look at my orchids. They'll cheer you up, and then perhaps we can talk things over again."

(To be continued)

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COMPILED BY E. PECKOVER

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THE AUSTRALIAN ORCHID REVIEW

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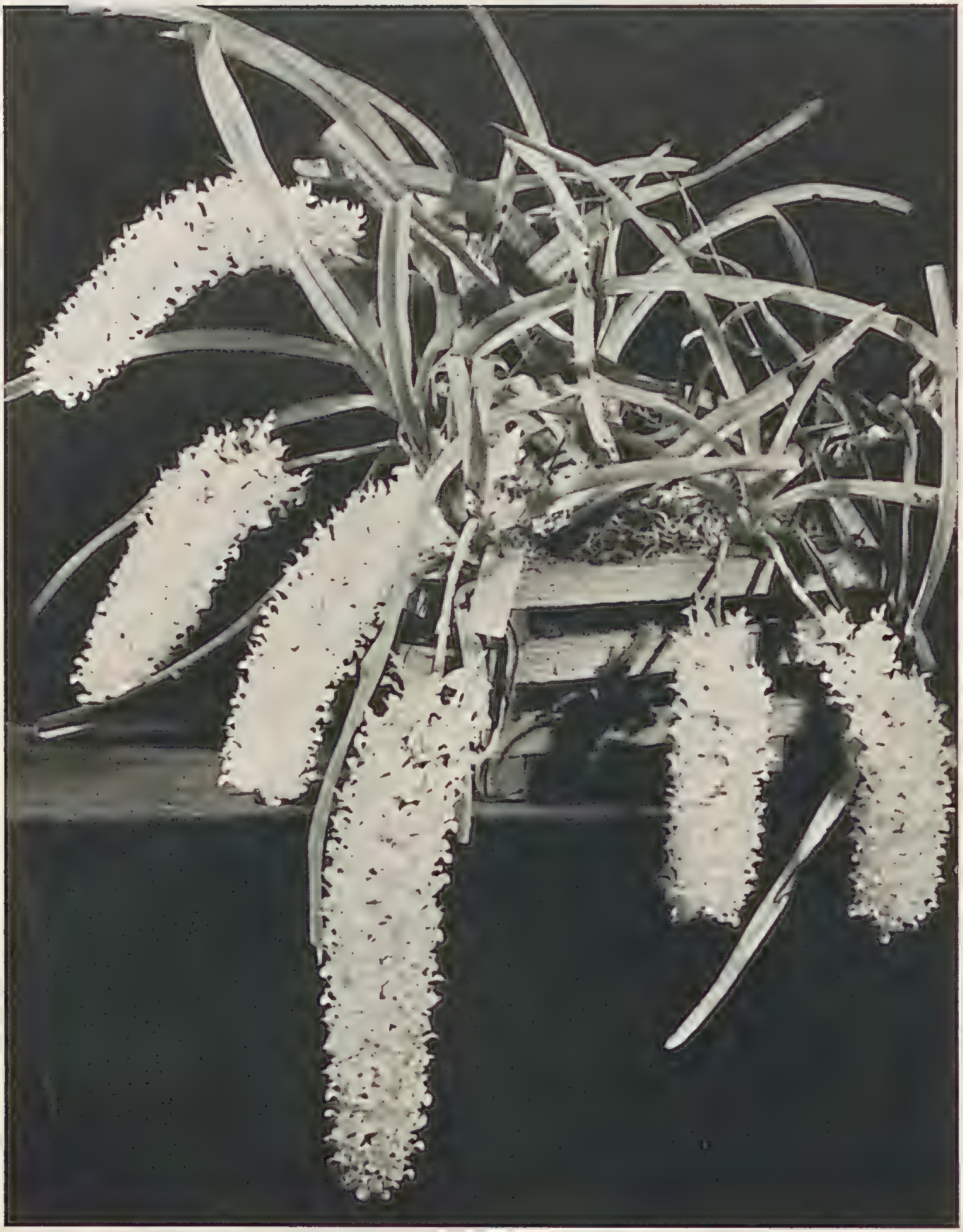

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Australian Orchid Review

Editorial

Books About Orchids

● Not the least interesting aspect of Orchidology, is a collection of books dealing with all phases of this rather extensive and popular branch of Botany. A glass-house containing a wide range of representatives of the Order *Orchidaceae,* a herbarium of specimens, and a library of books, would combine to furnish a rather complete approach to the study.

A herbarium would be useful to the student who requires specimens of exotic species which he cannot grow, as well as the numerous native species that are not amenable to the methods of the cultivator.

Of books, there are many, all useful in their particular manner of presentation, but most of them are out of print, and only procurable in the second-hand condition.

The Australian grower, up to the present, is still lacking the work that will instruct him in the management of Orchids under the vagaries of the Australian climate. The publishers of the *Australian Orchid Review*, however, announce that they have decided to publish a book entitled *A Cultural Table of Orchidaceous Plants*, by Mr. J. Murray Cox, Past President of the Queensland Orchid Society, and a successful grower of Orchids in Brisbane. Mr. Murray Cox's name is quite familiar to subscribers to the *Australian Orchid Review,* and therefore needs no introduction, his contributions speaking for themselves. Full particulars as to the scope of the work, and its price, will be supplied in a future issue of this *Review*.

The outstanding books which can be procured occasionally in the second-hand condition, are *A Manual of Orchidaceous Plants,* J. Veitch & Sons, 1894; a remarkably complete work which will form the basis to a collection. *Sanders' Orchid Guide,* revised (1927) edition; contains an immense amount of information, and a fitting companion to the book previously mentioned. *The Orchid Grower's Manual,* Williams, 1894, seventh edition; comparable with the foregoing as to completeness. *Orchids for Everyone,* C. H. Curtis, 1910; finely illustrated in colour, and black and white, useful to the beginner or expert. *Orchids, Their Culture and Management,* Watson and Chapman, 1903; a serviceable reference book.

The Woodlands Orchids, F. Boyle, 1901; coloured illustrations, and breezy stories of Orchid-hunting. *About Orchids, A Chat,* F. Boyle, 1893; coloured illustrations, and more about Orchid culture than in the previous book. *The Culture of Greenhouse Orchids,* F. Boyle, 1902, the best of Boyle's books from the cultural standpoint. *The Amateur Orchid Cultivators' Guide Book,* H. A. Burberry, 1900, third edition; coloured plates, and tabulated instructions for the treatment of Orchids, a fine handbook. *Orchids,* J. O'Brien; coloured plates, a very useful guide. *Orchids for Amateurs,* T. W. Briscoe, worth a place on the bookshelf. *Fertilization of Orchids,* C. Darwin; indispensable to those who are interested in the mechanisms of fertilization.

There are many other books that more or less contain the information of those already mentioned. There are also several very good foreign books, one of which, that does not require to be translated, being *American Orchid Culture,* E. A. White.

Messrs. N. H. Seward Pty. Ltd., 457c Bourke St., Melbourne, have stocked the above books from time to time, but the demand is so consistent, that they are unable to hold them for any length of time.

The Culture of Cymbidium Orchids with special reference to Pots and Potting

C. C. HILDEBRANDT, ***Roseville, N.S.W.***

● *Opening Remarks.*—In dealing with this subject I commence with a feeling of diffidence because most of the ground I have to cover on potting will be fully understood by many readers, and I will therefore ask their indulgence on that head.

Although I have had a garden as long as I can remember, and during the whole period I have grown various plants in pots or other containers, I only discovered about eight years ago that I knew little or nothing at all about correct potting. At that time I took up the culture of tuberous-rooted *Begonias* in pots, and it was the experience gained then, under the generous guidance of an enthusiastic professional gardening friend, that I learnt a lesson that has stood me in good stead ever since. I think it is safe to say that a very large percentage of beginners in the Orchid cult also know little or nothing about correct potting, and with this in mind I offer the following hints in detail, hoping they will be of some help.

Pots.—Ordinary clay pots are suitable for *Cymbidiums*. New pots should be brushed out with clean water and soaked for one hour before using. Used pots must be thoroughly scrubbed with sand and water, both inside and outside before being used again. If soaked in water for 24 hours before scrubbing, it makes this tiresome but very necessary job, much easier. I prefer the ordinary shaped flower pots for *Cymbidiums* because: (a) They are deeper than "tubs." (b) They do not require so many "crocks." (c) The drainage hole is easier to enlarge, and they are generally less cupped at the bottom, than tubs.

Drainage. — *Cymbidiums* require perfect, quick drainage. As the first step to accomplish this, I take the pot and enlarge the drainage hole from the centre to one side of the pot. I then place *clean* crocks in position—a large concave piece over the opening and smaller pieces on top. Next I add a few pieces of charcoal, and finish off with a layer of good, hard black fibre. This should fill about 25 per cent. of the pot. On top of the fibre place a layer of dried English Oak leaves. This prevents the compost from going down into the crocks and keeps the drainage perfect. Oak leaves are used because they decompose slowly and always remain sweet.

Compost.—It must be understood that *Cymbidiums* are cultivated under climatic conditions that vary greatly, and consequently composts have to vary to meet the conditions. For instance, here in Sydney, we have an ideal climate for growing *Cymbidiums*, and they flourish under bush-house conditions. In Melbourne, on the other hand, they have to be grown under glass and therefore the compost is entirely different to that required in Sydney. Over the last few years I have given considerable attention to the question of composts, and after many trials and experiments I recommend the following formula to give good results: 1½ measures fibrous loam (stacked 12 months) (or volcanic loam) (½ inch sieve), 1 measure oak leaf-mould (12 months old) and rubbed through ¼ inch sieve (or ½ measure of Peat Moss rubbed through ¼ inch sieve), 1 measure old cow manure in ½ inch lumps (12 months old) hard and dry, 1 measure coarse, gritty river sand (no other sand will do), 1 measure hard black fibre about 1 inch lumps (if fibre unavailable use 1 measure old tan bark). Do not use soft brown fibre. ¼ measure charcoal—½ inch lumps. Use a straight sided measure like a dipper or petrol tin (not a bucket), and mix thoroughly—turn four times. Store in a dry place and moisten slightly before potting. Keep all ingredients dry and under cover when not in use.

Although this formula may seem complicated to beginners I am sure that results will repay the trouble taken to provide it. I use it for all plants from rooted back-bulbs up to 14 inch pots.

Potting.—Flowering sized *Cymbidiums* require repotting every two years to keep them healthy and vigorous, and repotting is usually carried out during the spring. I will describe my method fully. First of all plants for repotting require to be well watered, and the water allowed to drain off. Turn the pots upside down and rap the edge of the pot sharply on the edge of a firm bench. Usually the plant easily leaves the pot and care must be taken to see the plant does not fall. I then remove the crocks, fibre and as much of the soil as possible with a thin stick and the balance I wash away with the hose. The roots are examined, old and rotted roots are cut away and back-bulbs severed as required. At this stage the good roots are all disentangled and hanging straight down. They receive a final hosing and the plant is ready for the new pot, which is usually two sizes larger than the old. After preparing the pot and drainage as previously set out, I place a couple of inches of compost on the oak leaves and lower the roots of the plant into the pot and hold the plant itself, in correct position required in the centre of the pot. I then fill the compost in carefully with the other hand—working in amongst the roots with the fingers, a little at a time, until the soil reaches to one inch below the rim of the pot. Firm the soil in with the fingers but do not use a rammer for *Cymbidiums.* Give the pot a sharp rap on the bench and this completes the operation. Water the pots three times after potting, and place them in a cool shady position for a few days.

Growing Conditions. — Experience has proved that *Cymbidiums* require: (a) an abundance of light and fresh air, and (b) cool, reasonably moist conditions, (c) protection from strong winds. These requirements can be met by the provision of a bush-house open to the east and north and closed on the south and west. An easterly aspect is very desirable. The frame of the bush-house is best covered with wire-netting and *lightly* covered with tea-tree so that plenty of broken sunlight may enter. I prefer to place the pots on benches, with ½ inch openings between the boards. This methods gives better ventilation and greater control of pests. The front benches (facing east) should be about 15 inches from the ground and if provision can be made for several rows of benches, build each row 6 inches higher than the one in front, up to 3 feet high. The object of this is to give all plants a chance of getting the benefit of the maximum amount of sunlight. To further this idea place all the smaller plants on the low front benches and the larger plants on the back benches. The ideal distance apart for 8/10 inch pots is about 18 inches—larger pots 2 feet apart. Smaller pots less than 18 inches apart according to size.

Watering.—During the late spring and summer months *Cymbidiums* require to be watered daily. I use a can with a rose for this job because: (a) water from the rose of a can does not disturb the compost, (b) each plant gets a regular correct amount of water, (c) plants get better supervision from the gardener through being sighted daily for watering. During the hot weather spray the foliage lightly with the hose, or syringe in the cool of the evening at frequent intervals. This reduces the temperature, cleanses the leaves from dust, sets up congenial conditions, and helps to keep thrips in check. Beginning early in February, gradually reduce the amount of water supplied to assist in firming and ripening the bulbs, and so help the plant to form its flowering spikes. During the winter months the plants only require to be watered when needed, say twice weekly or thereabouts according to the weather.

Diseases and Pests.—*Cymbidiums* are fairly free of disease. The worst trouble is the black spot. This seems to be a virus disease which attacks the roots just under the psuedo-bulbs and rots them, thus causing the plants to collapse. So far there is no remedy but research is going on in England and elsewhere with the object of overcoming it. Sometimes leaves and bulbs get sunburnt and this also turns black and apart from temporarily spoiling the appearance of the plant, it does little damage. The most frequent visitors in the form of pests, are the brown and black scale. Regular watch must be kept for these on both sides of the leaves and the bulbs, and infected plants should be promptly sprayed with a suitable preparation, several times. Red spider, thrips, green, and black flies are also troublesome from time-to-time but are easily overcome with spraying. If the plants are sprayed regularly every two weeks in the cool of the evening (after sundown) very little trouble will be experienced with most pests. Snails, slugs and slaters are easily controlled, the two former by the use of proprietary Meta preparations packed for the purpose, and the latter by Paris Green mixed with bran and distributed where required.

General Notes

Manure and Fertilisers.—I consider the mixture which I use rich enough to grow any healthy *Cymbidium* well. I am of the opinion that liquid manure and fertilisers are best left alone. The results which I have seen after the use of forcing manures has been adverse, and in one or two cases disastrous.

Weeds.—It is very desirable that weeds should be removed from the pots regularly, preferably when they are small. Most weeds have long roots which become entangled in the roots of the plant, and rob the soil of a large amount of nourishment and occasionally interfere with the drainage.

Mulching in the Summertime.—After carefully removing weeds I mulch the surface of the compost with peat moss (having rubbed it through a ¼ inch sieve). I find this entirely satisfactory and very helpful in keeping the roots of the plants cool and moist. I have also seen the dried foliage of the "Bush Oaks" (*Casuarina*) used for the same purpose. This is similar to "Pine Needles" in appearance, which also are quite satisfactory.

Rainwater.—If *Cymbidiums* can be regularly watered with rain-water, I think this is beneficial and well worth-while if the supply of water is available. The plants benefit greatly from rainfall. It is well to mention here that I believe if the pots are properly crocked and the compost is porous as suggested in the early part of this paper, no harm will come to the plants, from prolonged wet weather. The old idea of turning the pots over on their sides after a day or two of rain is entirely unnecessary, if the plants have been well crocked and potted in a suitable mixture, and are growing in any reasonably open position.

MILTONIA SPECTABILIS, Lal.
Photo taken by artificial light by C. F. Wallace, Rio de Janeiro, South America.

● Editorial matter, M.SS., and photographs should be sent direct to P. A. Gilbert, Hon. Editor, *The Australian Orchid Review,* 37 Colin Street, Lakemba, New South Wales.

Notes on Hybridization

W. F. ADAMSON, *Bulimba, Q.*

● The *Eu-Epidendrum* section of the genus *Epidendrum* does exceedingly well in Brisbane. *E. x Boundii* has been flowering in my garden for six months, and I believe it will flower for many more months. *E. x O'Brienianum* has been flowering for five months. *E. radicans* grows like a weed. It grows outside against a wall, and flowers here in July. I have raised two lots of *Epidendrum* hybrids; they are 1 year old. *E. Boundii* x *E. radicans,* and *E. O'Brienianum x E. radicans.* The *Boundii* seedlings are very vigorous, while those of *O'Brienianum* are delicate.

The slugs devoured a lovely batch of *E. O'Brienianum x E. Boundii.* I have tried for three years to cross the flowers of *E. Stamfordianum* with *E. O'Brienianum* without success. I have a lovely plant of *E. Stamfordianum* flowering under glass; it is carrying four large sprays, each about two feet long. I find that this plant likes basket culture, and about the same light that *Cattleyas* do. I crossed *E. Boundii* with *Calanthe veratrifolia,* and the plants are doing well.

I have raised some *Dendrobiums*—they are as follow: *D. superbiens* (very dark variety) x *D. undulatum. D. superbiens* (pure pink variety) x *D. Phalaenopsis* (white), *violet-pink* ipped sepals and petals).

D. chrysotoxum x *D. fimbriatum* var. *occulatum.* Another lot is a *D. Hildebrandtii* cross between 2 varieties. I tried to grow these seedlings on through the winter, but it would not work. I dried them out and they are doing fine. The pseudobulbs on both the *chrysotoxum* and *Hildebrandtii* crosses are fat, and do not seem to mind the loss of leaves. The *superbiens, Phalaenopsis* and *undulatum* crosses have retained their leaves, but are also resting. I have had to keep them fairly dry. This year I have forty *Dendrobium* seed pods. They comprise *superbiens* x *bigibbum, Phalaenopsis* x *superbiens,* and the reverse cross. *Phalaenopsis* var. *Schroederianum* x *undulatum* var. *Bloomfieldii, bigibbum* x *Phalaenopsis* var. *Schroederianum. Phalaenopsis* x *Phalaenopsis* var. *Schroederianum, D. chrysotoxum* x *D. pulchellum.* I have *Dendrobium Phalaenopsis* and *Cypripedium* hybrid seedlings coming along nicely. I have found the *Cypripediums* hard to raise. All these seedlings are growing in the compost of the parent plants.

Cypripediums

W. FAHEY, *Waverton, N.S.W.*

● I consider *Cypripediums* desirable types of Orchids to grow. They are easy to cultivate and very few flowers have their equal for lasting qualities. The blooms last from 6 to 8 weeks, and one can always have a decent show of flowers for the best part of the year, especially if he has some of the summer flowering varieties. *Cypripediums* flower in the winter, a good time, as it is generally a lean time for the flowers of other types. *Cypripediums* can be grown well under heated or cool-house conditions, and some varieties even in the garden under the shelter of trees.

I grow my plants under heated conditions on a bench, with a three tier staging, each tier about three inches higher than the other and wide enough to accommodate two rows of pots on each tier, the pots being close together. By standing them on tiers they are always under the direct eye of the grower. They are grown on the easterly side of a glass-house where they have plenty of light, but no direct sunlight all the year, and I have found they have done better on this side of the house than on the shaded side. I have noticed that *Cypripediums* enjoy a moist atmosphere and good ventilation, especially in the summer months when they are in full growth. Avoid cold draughts at all times. A good moist atmosphere could be obtained by placing shell grit about one inch deep on the bench, or by having shallow trays filled with water. The temperature never goes below 50 F. in the winter, but of course goes much higher in the summer.

Compost.—I have tried many mixtures and found that the *Cypripediums* seem to be very happy in the following compost: 70 per cent. chopped brown Todea fibre, sliced in squares of about 1 inch, 20 per cent. new tan bark, 10 per cent. finely chopped old Staghorn. In reference to tan bark as a sole compost, I have not been successful with it, but I have seen some fine plants grown in it, and I think the secret would be in the watering, perhaps three times a day in the summer, which would not be convenient for most people.

Potting.—First see that the pot is clean, make the drainage hole in the bottom of the pot a bit larger so as to make sure of the drainage, then fill up to about 1½ inches of clean crocks. Take your plant and cut off all dead roots and give it a good clean up by washing the leaves with a soft brush, using some soapy solution, then spray it with hose to remove all soap and any old soil from the roots. When you have done this you can give the leaves a spray with some good insecticide suitable for Orchids. When potting place about 1 inch of compost on top of the crocks, then hold your plant in the pot with the rhizone about ½ inch higher than the top of the pot and the new growth about the centre of the pot. Pack in the compost firm (not tight) around the roots.

When you have finished this, trim up any loose ends of fibre with shears, and top off with fresh sphagnum moss. (I find the moss a great help in summer to keep a check on any plant that may need more water.) Then give the plant a good soaking and stand it in a shaded position for a few days.

Watering.—There is no doubt that this is one of the most important points in the successful growing of *Cypripediums*, and must be controlled by the firmness of the compost, but providing the plant is potted with the correct drainage, no harm can come from over watering.

More water is needed when the plants are in full growth, say, from September to April. When watering make sure the whole of the compost is soaked and not just the top, don't be afraid—they can take it. I would suggest watering twice a day in the summer and once a day in the winter. At no time should the roots be allowed to dry out. *Cypripediums* are always on the move, and have no resting period. A plant well established will take more water than one just potted.

Spraying.— I usually give my plants a good spraying about once a month, and make a point not to miss the under part of the leaves. I have a frame made for this purpose which consists of two battens nailed on each side of the bench legs, one batten about 2 inches higher than the other to allow you to lay the plants almost upside down to give them a good spraying, and to prevent the spray from running down into the compost. This frame makes it easy, and one can do about twenty plants at a time.

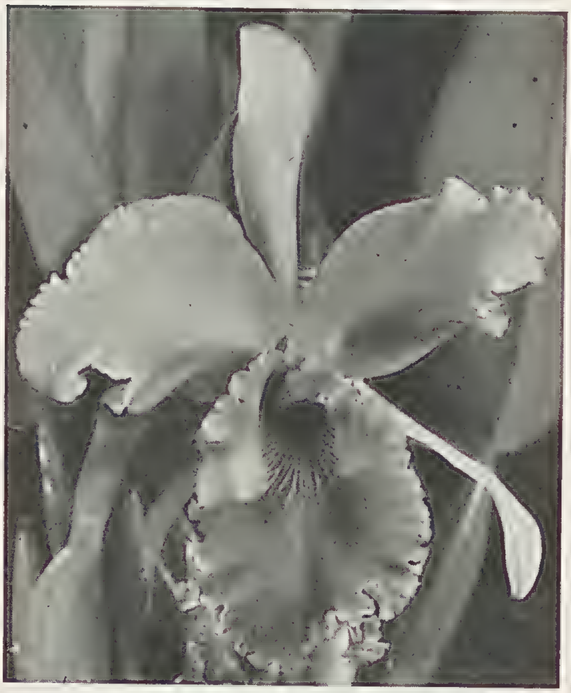
I have found that the most important time to give your plants a good spring cleaning is about early September, which seems to be the time "Mr. Thrips" calls to see if he has a chance of being made welcome for the summer. At this time I always clean the pots, wash the plants, and give them a good spraying, and it also gives me an opportunity of picking out any plants that may need repotting. Thrips seem to be more prevalent when growing under heated conditions than under the ordinary glasshouse.

Cypripediums, of course, are increased by division. This can be done almost at any time, but the best time would be about September when re-potting. I am not in favour of breaking up too much, I think it checks the plant. If at any time you find a plant damping off at the base, rub on some slaked lime. I have found this excellent, and also rub some on the break, when dividing plants.

I will conclude with the hope that I may help someone to grow these beautiful plants, and if so, I'll feel pleased that my humble effort has not been wasted.

● ***Corybas or Corysanthes?***—The Rev. H. M. R. Rupp discusses this once controversial question in the August issue of the *Victorian Naturalist,* and although he has in the past been a strong advocate of Brown's name, *Corysanthes,* he now recommends that the clear decision of the International Council for Nomenclature, in favour of Salisbury's *Corybas,* should be loyally accepted by all. *Corybas* was rejected by Bentham (see *Flora Australiensis, vol. vi.,* p. 350) on grounds which were ethical rather than scientific; but there is no doubt of its priority in publication. From a practical point of view, it is a shorter name than *Corysanthes* with a similar meaning, and it avoids confusion with the South American genus *Coryanthes.* Mr. W. H. Nicholls, the well-known Victorian orchidologist, adds a brief note endorsing Mr. Rupp's views.

● "I saw some beautiful collections in Melbourne—there is no question they can grow *Cymbidiums* really spectacularly under glass. The plants are beautifully green and are something to be seen to appreciate. They seem to grow in Melbourne far better than they do in England, possibly due to the more congenial climate. In this respect Melbourne seems to be fortunate in having a climate just cold enough to make heat necessary, which brings with it added advantages of protection from the elements and pests, and at the same time to provide a good atmosphere and sunlight in which they can grow."—G.H.S., 23/7/1942.



LAELIOCATTLEYA x WILODEN
(Lc. Woden x C. President Wilson)
Grown by T. F. Donnelly, Brisbane, Q.

● ***Laeliocattleya x Wiloden.***—Of good shape, sepals good colour; petals fringed, broad; sepals and petals rose purple; lip large, well shaped, fringed edges, front reddish purple, sides rose purple, throat yellow richly striped with red—a very beautiful flower.—*T. F. Donnelly, Windsor, Queensland.*

● Wherever exhibitions are held, and however small and inferior they may be, they will be instructive and inspiring, and an increasingly higher standard will emerge through emulation, and through the years that are yet to come.—B. & F.

Queensland Orchid Society

Office Bearers for 1943

● The following gentlemen were elected to office for the current year, at the Annual General Meeting held on February 12th:—

President, J. Gordon Smith. Vice-Presidents (Metropolitan), C. A. Hilsden, H. J. Campbell, and E. J. Beard; (Country), A. J. McFie (Gympie), Dr. C. N. Matheson (Rockhampton), and T. Harris (Coolangatta). Hon. Secretary, T. C. Harveyson. Hon. Treasurer, E. J. Beard. Hon. Technical Adviser, C. T. White. Hon. Auditor, Allen W. Higgins. Committee, Dr. D. A. Herbert, Messrs. C. A. Hilsden, F. A. Farr, J. Smolinski, R. A. Johnson, J. Lewis, R. G. Ferguson and H. Stevens.

Cool House Culture and Notes for Amateurs

T. H. JAMES, *Hazelbrook, N.S.W.*

● With the approach of autumn, the chief function of Orchids is the maturing of their bulbs. It is the treatment which plants receive, and the conditions prevailing, during this period of maturation, which determine whether or not the plants will flower in the next cycle of growth, not necessarily spring. I had long been aware of this law as applied to flowering plants, and bulbs generally, and had endeavoured, whenever possible, to see that my numerous plants and bulbs received more care, if anything, after flowering than before, to prepare for the next season. Through some mental lapse I failed to realise that those laws applied equally to Orchids.

The matter was brought home to me very logically, and forcibly, at the January meeting of the Orchid Society of New South Wales and some of my views have undergone considerable alteration. The Society mentioned has the good fortune to number among its members, Dr. A. J. Vote, a medical man, who in addition to his general medical knowledge embracing Biology and Physiology, has also studied the laws of Mendel relating to plant life, and also plant physiology. Although one of our recent members, he has applied his scientific knowledge to the culture of Orchids so effectively that he is without exception, the most consistently successful exhibitor at our meetings, and the plants shown by him are not merely well grown, but generally, superbly grown. Some of his articles will appear from time to time in this Review.

The main point which he proved to my satisfaction, and to most of those who heard him, was that from the inception of new growth, whether in the spring or any other period, the Orchid must be fed right up to maturity. By feeding I do not mean dosing with fertilisers, but the regular application of water which is the only means a plant has of absorbing the chemicals for existence. Most of us have had ideas about suspending or easing the application of water at certain periods of growth, but the great majority of those who heard Dr. Vote's address will, I believe, in future keep their plants damp during the whole growing period. This is not so easy as it sounds.

I have been in glass-houses, and seen plants which can rarely be anything but really wet or dry. The nature of the compost, and lack of efficient ventilation, render it almost impossible to obtain that condition of moisture without being wet, so essental for successful culture. I have stated on several occasions that I consider compost less important than light, water and air. You will find flowers obtaining a measure of success with widely different composts, but in every such case it will be found that it is open, porous, and of a nature that will retain a certain amount of moisture but will never be wet. Before going on to generalities I would again urge growers to eliminate "orthodox" and its partner "tradition" from their vocabulary. Those ideas are a hindrance to reform and progress, and frequently prevent them working out their own particular problems. Remember Orchids are a form of plant life, and require an abundance of air and water, and, in a varying degree, light. To expect to grow Orchids well in stuffy or heavily shaded houses is hopeless.

Light.—In a bush house this is often difficult to regulate but see that no climber or other vegetation is blocking the light. In the glass-house those who use blinds should gradually remove them altogether, and where the glass is painted remove as much of that as possible. During the late autumn and winter months clear glass would be beneficial. If there is an abundance of air, and the plants are well watered, particularly at night, it is surprising what an amount of light Orchids will stand. During the hot days of January and February, my *Cattleyas* have been exposed to almost full sunlight due to most of the paint having been washed away, but there is not a trace of burn.

Ventilation.—Because the cooler weather is approaching is no reason for sealing up the house, but some of the ventilators could be partially closed on the windy side. In my house at Longueville there was nearly as much open space as enclosed, so I could not reduce the ventilation had I so desired, and yet *Cattleyas* flourished.

Cattleyas.—Keep them damp until the pseudobulbs have completely matured and, in those types which flower early, until the flowers have opened. Many make their sheaths but do not flower until spring. After flowering or maturing, water sparingly. If the house itself has the requisite humidity there should be sufficient moisture in the air to maintain them but if not, give a little water occasionally to keep the pseudobulbs plump. If grown in a bush-house, I would suggest protecting from rain, although I know of some plants which thrive outside all the year. Watch the flower sheaths of spring bloomers. They are apt to become dry and porous, and moisture may penetrate and rot the buds. If doubtful it would be better to split the sheath. Remove any dry base sheaths which are generally damp underneath, and may cause the eyes to rot.

Dendrobiums.—Keep the water going until the last leaf has matured, then treat them similarly to *Cattleyas* until the flower buds appear, generally about June. Give all the light and air possible.

Cymbidiums.—I used to believe in a certain amount of drying during February and March in order, as I thought, to harden the bulbs with the idea of including flower spikes. That idea has gone overboard now, and I shall keep the water going until the bulbs have completely matured. I have noticed that more and more growers are realising that light is essential to free flowering, and some have been surprised that direct sunlight has not burnt the foliage where the plants have been kept damp. The one thing that is damaging is the exposure to hot winds. After hot days spray the foliage in the evening.

Cypripediums.—These will now be showing their flower buds, and this period is the only time when care is necessary in regard to overhead watering. In the bush-house or a particularly well ventilated glass-house the danger of buds rotting is not so great, but in most glass-houses the danger is real. To simplify matters those showing buds could be grouped apart from those that are not, supplying water to the pots only.

Thunias.—The fact that flowering has past does not indicate that growth has finished. The bulbs will go on building up until the leaves begin to fade, and then the watering should be discontinued. If they do not flower the bulbs will continue to increase in length, and the finishing of the growth of the unflowered pseudobulbs will be a guide to the period of the maturing of the flowered pseudobulbs. When leaves have fallen keep them in a cool place, but not in a dry shed. I usually turn the pots on their sides under the shade of a tree. There is sufficient moisture in the air to keep the bulbs plump. They will not stand frost.

Phaius.—I found that these did not, with me, appreciate outside treatment during winter, and as soon as the cold weather arrives, they are moved to inside the glass-house. I have not heard of anyone who, like myself, is growing them outside in full sunshine, but possibly there are some. They grow and flower well with me. Inside the foliage is apt to grow very long and take up much valuable space, whereas outside the leaves are short, broad and sturdy. Keep the water going freely until growth has finished and then ease up.

Miltonias.—The hybrids are notoriously hard to grow but mainly, I believe, to our ignorance of their requirements. Some growers are now meeting with success, and, after hearing Dr. Vote's remarks concerning them, which will appear in this Review in due course, many will no doubt again try them. They are certainly well worth the effort. With me they have hitherto been a failure, but the species have been an unqualified success. I have grown and flowered *Miltonia spectabilis* for many years on a block of hard fibre, and it receives nothing but water, and plenty of it. About twelve months ago I obtained *Miltonia Clowesii, M. cuneata,* and *M. Moreliana.* All are growing on pieces of fibre, and although they were small plants when obtained, they now have 3, 2, and 4 leads, and two are flowering. They require cool-house conditions, but will grow in a bush-house provided they get the protection of a glass-house in the winter. They are so easy to grow that growers should obtain them if the opportunity offers, particularly *Clowesii* and *cuneata.*

Keep *Oncidium varicosum,* var. *Rogersii* in mind. It is a particularly beautiful Orchid and very easy to grow.

● *Cypripedium Haynaldianum* and *C. Lowii* are occasionally misnamed. *Haynaldianum* has a dorsal sepal which is rosy apically, the basal half being yellowish green, and spotted with brown. *Lowii* has a yellowish dorsal sepal veined with brownish purple at the base, no spots.

● Subscriptions for the Australian Orchid Review, 6/- (six shillings), should be posted to Australian Orchid Review, c/o Messrs. Shepherd and Newman Pty. Ltd., Yurong Street, Sydney, N.S.W.

● Membership subscriptions to The Orchid Society of New South Wales for 1942-1943 are now due and payable to the Honorary Treasurer, Mr. G. J. C. Tosi, 39 Martin Place, Sydney.

Stimulation of Orchid Growth

J. H. SKERMAN, *Maleny, Q.*

● Having noted from time to time articles on manuring of Orchids, and also articles on the pH value of composts for plants at various stages of growth, the writer has started on an experiment to test whether Orchid growth can be "stepped up" by alternate treatments. From those contributions we should accept it as true that by giving weak solutions of liquid manure a stimulation of growth has been achieved. The next step is to endeavour to ascertain if the "step up" can be held constant, and at the same time strengthen the plant, if not to further increase its growth.

As it is fundamentally necessary for the plants to have an acid compost according to their variety and stage of growth, it follows that this basis of its life must never be converted to alkalinity. As all solutions of manures are alkaline, it would be sheer folly to give the compost such an impregnation of it as to offset or neutralise its acidity. It may be that we do not know sufficient about the requirements of our plants, and much awaits our trials. We know that plants favour certain trees, and are seldom or never found on others; while when a tree dies the plant dies with it, excepting varieties such as *Cymbidiums* which wallow in the stump of a tree or a hole in its trunk. To put the case precisely, can the plant in its natural condition derive the maximum of its growth while contending against the vicissitudes of Nature, or can a plant be brought to a perfect state by human skill, and if so, what is the stage that may be reached? Can it be truly said that an Orchid is not a parasite? Does it really depend on the tree for support and moisture only? If so, then why not any green tree for its support and growth? Does the tannin of certain tree barks provide the necessary acidity, or other requirements we are not too familiar about? If it calls on the tree for its tannin, does it not take from the tree that which the tree requires for itself, and becomes a robber though not in the same class as mistletoe which will, unhindered, kill the tree. Will a plant benefit by varying the acidity of the compost from time to time? We like change ourselves, and other plants and crops improve with changes in their environment. Do manures provide a stimulant or food, independent of the corrective properties of alkalinity? Will alternating applications of manuring and tannin from tree barks "step up" its growth and strengthen the plant?

The two plants of Dendrobium nobile referred to above.
Photo by Dr. A. J. Parer, Maleny, Q.

This is what the writer has set out to experiment on. Two plants of *Dendrobium nobile* have had applications of liquid sheep manure for two consecutive seasons. Two seasons ago only two weak applications were given at intervals of about a week. Last season five applications were given at intervals of three or four days. The technique followed was to put enough manure into a kerosene tin, to fill it to a third, then fill with water and stir well three or four times during twenty-four hours. This is called a syrup, and after stirring strain about two inches into a watering can and fill with water and spray the compost, usually saturating it. The plant which is showing only a few bulbs has increased the length of its bulbs from ten to fourteen inches to thirty-three inches; each of its forty flowers being three and three-quarter inches across. The plant with many bulbs which were yellow when it arrived from India, have grown from eight to twelve inches to twenty-two inches, and are now dark green in colour; each of its one hundred and eighty flowers is two and three quarter inches across. The sepals and petals are nearly white, having only a little purple at the tips, and have a slight twist. It bulbs prolifically, and seems to spend its energy this way. At flowering it had twenty-three new growths up to ten inches to the top of the leaf, and many more are now showing. This season no manuring is contemplated, and already four applications of tannin from the bark of our scrub hickory tree has been applied in weak solutions, the technique of which is the same as that of manuring with the exception that the bark was left to soak for three days before using. The object is to hold the growth made, and allow the plant to accommodate itself to its new transition before attempting further stimulation, either by manuring or other experiments which its behaviour may suggest. The tannin gives the reaction of bright orange colour with the B.D.H. soil testing outfit. New growths are developing fastly. Both plants hang in an ordinary bush house.

We know that plants absorb or eat up the compost or soil in which they are planted, so that new or additional compost is required from time to time. But for the growing over the sides of the baskets or pots, it appears to the writer that repotting could be dispensed with, and that by feeding the necessary elements and fluctuations in the acidity good results should be obtained. Since trees vary in the flow of their sap with their periods of rest and activity, so it is apparent that the Orchid upon the tree must at least accommodate itself to this condition, and this fluctuation has become an hereditary trait. We know too that an animal which is weakly will contract sickness or diseases more readily than one which is healthy. Alternatively, to stimulate the growth of an animal or plant is to put it into a condition, or, on a basis, from which further progress can be made.

Exhibits

W. WORTH, *Willoughby, N.S.W.*

● The exhibits shown at the December 17, 1942, meeting of the O.S. of N.S.W., were very colourful and, without exception, they were well grown. Species predominated, and three of the four plants that caught the eye, and are described below, were species. When as well grown as these were, they prove themselves well worth while, and of at least equal beauty to some of the more modern hybrids.

Renanthera Imshootiana (Mr. T. H. James). A fine plant, carrying about 60 crimson coloured moth-like flowers on two sprays. A desirable species in any collection. The large flowers were a particularly good colour. Grown in a wooden basket in charcoal, fibre, and some pieces of half-rotted wood. Because it is hung high in a cool glass-house, the nature of the potting material, and the basket culture, it receives copious, and frequent watering.

Dendrobium fimbriatum Paxtonii (Dr. J. A. Vote). A particularly well-grown specimen plant of this fine species. There are plenty of new leafy growths, a number being three feet in length. It flowers on the previous year's growths, and occasionally, on the new, and carries very large orange coloured flowers with chestnut blotches. Has thrived under glass in a wooden basket with fibre only. It receives an abundance of water when in active growth.

Dendrobium chrysotoxum (Miss F. Burt). This plant was acquired a little over three years ago, and had obviously been taken from a rock. It did not do very well in a basket. Now growing on Tasmanian todea fibre and sphagnum moss, unpotted, it is hung high in the glass-house, and receives a maximum amount of light. The glass is almost clear. Once a week it is watered with a weak solution of chemical nutrient. A fine leafy plant, it carried 7 spikes of good sized flowers, and its roots are round and all through the one football of fibre. It is watered at least every second day in summer.

Brassocattleya x Melrose (Mr. C. C. Hildebrandt). Two large rose-purple flowers of good form, graced this five-bulbed plant. The colour bright purple, and the labellum of a much darker shade. Like all other *Cattleyas* in the exhibitor's collection, the potting material used is Japanese osmunda fibre and sphagnum. The sphagnum is first washed in clean rain

Continued on page 16

Exhibits

Shown at the November, 1942, Meeting of the Orchid Society of N.S.W.

DR. J. A. VOTE, *Hurstville, N.S.W.*

1. ***Cypripedium Haynaldianum*** (Mr. T. James). Grown in a large pot, pure tan bark, under glass in cool conditions. Plant well grown and obviously flourishing. Flowering from one growth; very thick and rigid stem bearing 8 flowers, flower attractive, something like *Lowii.* The fact of all the flowers opening at the one time is a distinct advantage over the *Selenipedium* type. Eight new growths.

2. ***Dendrobium macrophyllum.*** Introduced about a year ago from New Guinea by Dr. Jaede. Its habit and flowers are something like *Dend. atroviolaceum* but the flowers are much more numerous and open better, larger, and, like *atroviolaceum,* are long lasting, the present spike being out for two months, and showing no sign of deterioration. It should prove of easy culture as the first growth under Mr. James's care was very good and made an attempt to flower. It should grow under a wide variation of treatment judging by the plant exhibited. It will certainly do well under cool glass-house conditions.

1. ***Lycaste Deppei*** (Mr. W. Fahey). This was a rather large plant of some 7 or 8 bulbs, the forward leads showing definite improvement since the plant had had altered treatment, mainly a change in the nature of the compost. There were at least four back bulbs carrying no roots, these being sustained by the forward growths. These were removed by Mr. Fahey later in the evening to the benefit of the plant, and also my collection of *Lycastes,* and I must thank Mr. Fahey for his gift, as without a doubt it is a very desirable Orchid. The flowers are borne on long stems, and unlike *Lycaste Skinneri,* they appear with the new growth. The compost should be light and well drained, namely—tan bark 50 per cent., fibre 25 per cent., leaf mould 15 per cent., 5 per cent. very old cow manure, and 5 per cent. coarse sand. The plant was grown in a heated glass-house, and the compost kept moist from the time the new growth appears until the bulb is made up. Good ventilation is essential to avoid damping off of the new growth.

2. ***Odontoglossum x Jason.*** This was quite a small plant which less than a year ago was on its way to the mortuary. However, under different treatment the plant revived, made up a small clean bulb, and rejoicing on its narrow escape returned thanks to Mr. Fahey with one flower just to impress him with the fact that it was well worth saving. The plant is potted high in a small pot with half crocks, well drained, and the compost is about 6 parts fibre, 2 parts tan bark, 1 part leaf mould, and 1 part coarse sand. The top is dressed with moss.

This plant was grown in a heated house, but would do better in a cool house. They must have shade and above all they must be kept clean. Like *Miltonias, Odontoglossums,* and allied species are the most susceptible plants to disease in my knowledge, and they are by far the quickest to deteriorate. I believe, and have proven personally, and Mr. Fahey gives added proof, that *Odontoglossum* and *Miltonias* can be grown in Sydney conditions. If a run down plant, trembling on the edge of the grave can be revived to the point of flowering, then there is nothing more certain that a plant in full vigour can be maintained in that vigour with reasonable care.

1. ***Dendrobium (Dalhousianum) pulchellum*** (Dr. J. A. Vote). Potted in pure fibre, half crocks; good stout canes about 3 feet tall, two spikes on last year's cane carrying 13 and 7 large flowers. Grown in the glass house, cool or warm, water copiously from the time the new growth appears, but it must be very well ventilated or the growth will surely die off, water is withheld when the terminal leaf has been made on the new bulb so that the bulb is hardened and will ripen to produce flowers in due season. After this, it receives no water at all, the moist conditions of the house preventing shrivelling of the psuedobulbs. None of the *Dendrobiums* exhibited by Dr. Vote had been watered for the previous two months.

2. ***Dendrobium Parishii.*** Mr. James commented that this was the best plant of *D. Parishii* he had seen exhibited. It was in flower from the extreme tip to the compost, on six bulbs. The stems were about 15 inches to 9 inches long, and flowered at every node in clusters of 3's and 2's, total flowers were about 130 to 140. Potted as above.

3. ***Dendrobium Devonianum.*** Potted as above. Dependent in habit; treatment similar to above. Flowered on 6 leads and also on several small aerials, and the flowers were from the tip to within a few inches of the compost.

4. ***Dendrobium lituiflorum.*** Treatment as above, flowered on 2 canes made this year from the tip of the cane to within a couple of inches of the compost.

5. ***Oncidium Kramerianum.*** This species makes small disc-like pseudobulbs, flowers from the base of the pseudobulbs on a long spike, one flower appearing, dying, and another one taking its place, like the habit of the *Selenipediums.* The flower is unique, very striking and is about 4 inches by 2½ inches in size. The top three petals are slender and stand erect like the Prince of Wales plumes. The lip forms the biggest part of the flower and is yellow, crenated, and heavily spotted with brown. The lateral petals curve downwards to the sides of the large lip; yellow barred with brown. The plant exhibited had two spikes from the leading bulb each about 2 feet to 2 feet 6 inches tall, and each spike had borne over a dozen flowers. The spikes must be cut very near the bulb, otherwise it will flower itself to death. It should be grown in a basket in the following compost—80 per cent. fibre, 20 per cent. tan bark. The compost should be packed tight and the base of the pseudobulb on the compost and not buried. It must be grown under heated conditions the same as *Cattleyas.* Water well when the new growth appears and until the pseudobulb is fattened. Good ventilation is essential to avoid rotting the new lead. Markedly decrease the water to ripen the pseudobulbs, as the pseudobulbs are very hard, and are obviously made to withstand hard conditions.

6. ***Miltonia Hybrid.*** This was a very small plant bought when in very bad condition about a year ago. The existing small lead was saved and made a small pseudobulb, the present pseudobulb was superior to any of the other pseudobulbs, but still small. It threw a small spike bearing two flowers of a most beautiful bright iridescent crimson, white at the edges, and with white and yellow in the throat, but 90 per cent. of the flower is a blood red.

Its treatment was the same as that which I have described under the *Odontoglossum* of Mr. Fahey.

It also supports my claim that this Orchid, probably one of the most beautiful of all Orchid plants, can be successfully grown.

I have six *Miltonias,* all bought in very sorry condition, over the last 2 years. All have grown quite well and can be truthfully said to be flourishing, and all have flowered and have appeared at the Orchid Society's meetings from time to time.

The foregoing are the descriptions of the plants exhibited, along the lines decided at our previous meeting. In this case they are reported and discussed by me, but the exhibits of the December meeting will be described by Mr. W. Worth.

I have endeavoured to include some remarks as to their culture. As the plants exhibited are usually exhibited for their success it follows that their culture is correct and moreover, the culture requirements will in the end become quite detailed as the same type will be variously treated by various members.

The above descriptions are my first attempt, and I hope it will be received kindly, but nevertheless I think that its presentation should be criticised, and, if necessary amended, and I personally would welcome any just criticism, so that in the end we may work towards establishing an authoritative source of information that any member might consult on the particular treatment of any individual type of Orchid.

● ***Epidendrum O'Brienianum.***—It is rather surprising to find how few orchid-growers know anything about the origin of this hardy favourite, which grows so luxuriantly in the open air gardens of Sydney, and produces its brilliant racemes of flowers the whole year round. In the writer's garden it also produces, quite freely, substantial seed-capsules, though up to the present I have been unable to identify the pollinating agent. Whether the seed is fertile or not I do not know. The "Crucifix Orchid," as it is often called, is a hybrid raised by the late Mr. Seden at Veitch's famous nurseries in England, in the 'eighties of the 19th century. It was described and figured by Rolfe in the "Gardener's Chronicle," III, s. 3, 1888, p. 770. The parents were *Epidendrum radicans* Pav. MS ex Lindl., Gen. & Sp. Orch. (1831), p. 104, and *E. evectum* Hook. f., Bot. Mag. t. 5902.

E. radicans originally came from Guatemala. Its colour is "rich cinnabar red, shaded with deep scarlet." *E. evectum* is a native of New Granada; the colour is magenta-purple. *E. O'Brienianum* combines the characteristics of both parents in remarkably even degree; and like them it is very prolific in the matter of aerial growths.—*H.M.R.R.*

● Articles, notes and photographs of Orchids are needed to keep the *Australian Orchid Review* in publication these difficult times. Notes on some phase of culture will be of great interest to other growers.

Commercial Orchid Growing

DR. D. A. HERBERT, D.Sc., *University of Queensland.*

● The cultivation of Orchids in England was originally restricted to the European species, but about 200 years ago the first tropical species were introduced into English conservatories. *Bletia verecunda,* a plant with leaves up to 3 feet long and with a long scape of rose-coloured flowers was brought across from the West Indies in 1731 and by the end of the century a fair range of Orchids, including *Epidendrums* and *Vanilla,* was in cultivation. *Epidendrum* in the eighteenth century was the name applied to epiphytic Orchids in general, and in 1807, over one hundred species were listed under that genus. The great development of Orchid growing as a hobby developed in the nineteenth century, and there were two important factors responsible; first, the methods of successful cultivation of epiphytes were developed, and second, with the better understanding of their culture, and greater certainty of success, new and rare species began to pour in from all parts of the tropics. As the hobby developed into a craze, fabulous prices were paid for rarities, though it should be pointed out that their exceptional size and condition were often one reason for their cost.

With explorers combing mountains and swamps in out of the way corners of the earth in the hope of that reward which sweetens labour the world's Orchid census mounted rapidly, and as the climatic requirements of the species became better known it became possible to multiply stocks under nursery conditions.

The great Orchid houses in the latter half of the nineteenth century added to the already large total by producing new hybrids, the first of which was *Calanthe Dominii,* a cross raised in Veitch's nursery by Dominy in 1856, using *Calanthe masuca* and *C. furcata* as parents. This was the forerunner of the great stream of hybrids which in some groups such as *Cattleya, Laelia* and *Brassavola* have thrust their parents into the background. But, though Orchids may be hybridised readily, provided of course that due respect is paid to the kinship of the parents, the raising of the progeny was not so easy in the nineteenth century. Those who possessed the secret, such as it was, guarded it carefully behind locked doors. The secret was that the seed was sown on compost in which the parent plants were growing.

In 1899 the Frenchman, Noel Bernard, was engaged in research on this question of germination of Orchid seed, and he showed the necessity of the presence of a fungus. Following his work, hybridisers had a method of raising their seedlings without the frequent failures that had attended their predecessors' efforts, because the fungus could be cultivated and any uncertainty of seedling infection avoided. A further advance came in 1922 when Dr. Knudson, in America, devised a method whereby the sugar that the fungus provided could be made available to the seedlings, and the fungus left out of the programme.

Such discoveries have naturally had a tremendous effect on Orchid growing. The grower who buys plants already fairly well advanced may use methods of culture little in advance of those used last century, but the plants themselves, if they are hybrids probably commenced life in a test tube. An Orchid capsule may contain hundreds of thousands of seeds and so from one promising cross an enormous number of plants can be raised. So it has been possible for the cut flower trade in Orchids to be developed on a huge scale. This has reached its culmination in America where one firm alone claims to produce a *Cattleya* flower a minute. There are 170,000 flowering *Cattleyas* and 85,000 seedlings in the Thomas Young nurseries of New York, Chicago, and Boston, returning an annual nett profit of more than 100,000 dollars. About 30 new crosses are made each year by this firm and those which do not satisfy trade requirements are scrapped. The plants are not sold, lest competitors exploit them.

The popularity of Orchids in the United States has been deliberately and carefully cultivated by the trade, full advantage being taken of Mother's Day, Christmas and Easter. Mass production enables a florist to get his Orchids as he needs them, preferably of course on the day of the sale, but if he cannot do that he keeps them in refrigeration. A day or two does not make any difference to the quality, but after that the blooms are a precarious asset. The consequence is that in spite of mass production, *Cattleyas* that cost a dollar and a half wholesale may be sold retail for 3, 4, or even 5 dollars to cover the loss of blooms that are not bought within the safe period.

"Saying it with Orchids"

J. MURRAY COX, *Brisbane, Q.*

Continued from December, 1942, issue

"Thank you, thank you, Mr. Smithers," said Herr Hitler, wringing the Australian's hand. "Would you mind if I called you Ethel?"

"Well—er—I'd rather you make it Bert, if you don't mind," replied our hero, "Ethel's a bit feminine, you know."

The car, with its escort of storm-troopers, mounted upon motor cycles, stopped near the pontoon at which *M.L. Sanderiana* was moored. The storm-troopers formed a corridor through which the Fuhrer, the Lieutenant and Ethelbert Smithers walked abreast. Herr Hitler gasped when he saw the tiny craft.

"And you sailed all the way from Australia in that tiny boat?" he asked admiringly. "I think you must be a descendant of that famous Captain Cook, who discovered Australia. He was really a German, you know, and therefore Australia rightfully belongs to us. I'll adjust that later when I dictate my peace terms."

"Now then, Dolph," replied Ethelbert chidingly, "You haven't come here to dictate peace terms. You've come to see my orchids, and to try to revive the love of beauty and peace in your warped and frustrated soul. Come along now."

He led the way on board the yacht and aft to the glasshouse door.

"Hop in quickly when I open the door," he said authoritatively. "I don't want too much cold air to get in."

He opened the door carefully, and with his two companions stepped quickly inside. The perspiration started to their foreheads, for the atmosphere within was humid and laden with the heavy perfume of many orchids. On tiers of benches a couple of hundred plants were in full bloom, their brilliant colours giving an impression of Aladdin's wonderful cave of gems. Glorious Cattleyas, chaste Lycastes, delicate Miltonias, Dendrobiums, Vandas, and many other genera were there in all their glory and splendour.

The Fuhrer gasped and gulped. Then stood for some moments immobile and silent.

"But, my dear friend," he said at last. "You have wrought a miracle. Already I feel within me the quickening of a new love of beauty, of colour, of art; already I feel that my true mission in life is the translation of moods into colour. I shall paint again. I shall become a great artist, the greatest the world has ever seen. I shall give collections of my pictures to all the cities of the world, and men will forget Adolph Hitler the Liberator and remember only Adolph Hitler the Artist. But you had better take me round and tell me all about each of these lovely plants."

He threaded his arm in that of Ethelbert's, and for the next hour the three men moved slowly from plant to plant while Smithers told the history and explained the virtue of each of his treasures. Herr Hitler waxed ever more enthusiastic at the beauty and chaste loveliness of each succeeding plant.

"Friend Smithers," he said, "I owe more to you than to any man, for you have shown me wherein true happiness lies. I shall commence growing orchids at once, and, moreover, I shall endeavour to bring this senseless war to a close. If the people of the British Empire will agree to discuss with me the methods by means of which a better and brighter world can be created, I have no doubt we can come to some arrangement whereby contentment can be given to all the people of the earth. We must make an end of this era of imperialism, this selfish manoeuvring for gain, this intolerable throat-cutting competition for the good things of life; and introduce a new age in which each man will strive, according to his talents, to benefit the whole human race. An era when there shall be no wars, no nations and no divisions, but a contented and industrious mankind which strives as one united force to inculcate the benefits of security, comfort, beauty and love among all men."

To be continued.

Continued from page 12

water, chopped into pieces an inch or so in length. The mixture is then rammed that tight into the pot that the whole can be lifted by taking hold of the plant. Good light, ventilation, and a buoyant atmosphere at all times is considered absolutely essential. This means more coke in winter, and more water too. The plants sometimes receive water twice a day in summer. The roof is high and the plants stand on benches. The squat light porous pot in which this plant grows has not proved of any decided advantage over the usual earthenware ones.

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"*I believe the information I give will assist considerably, but I would emphasise that no one can set out an arbitrary code of rules for the culture of any Orchid. The best that can be done is to give a general outline based on the plants' natural requirements, and each grower must then modify this to meet the peculiarities of his own conditions.*"

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The author of each article is responsible for the facts and opinions expressed therein.

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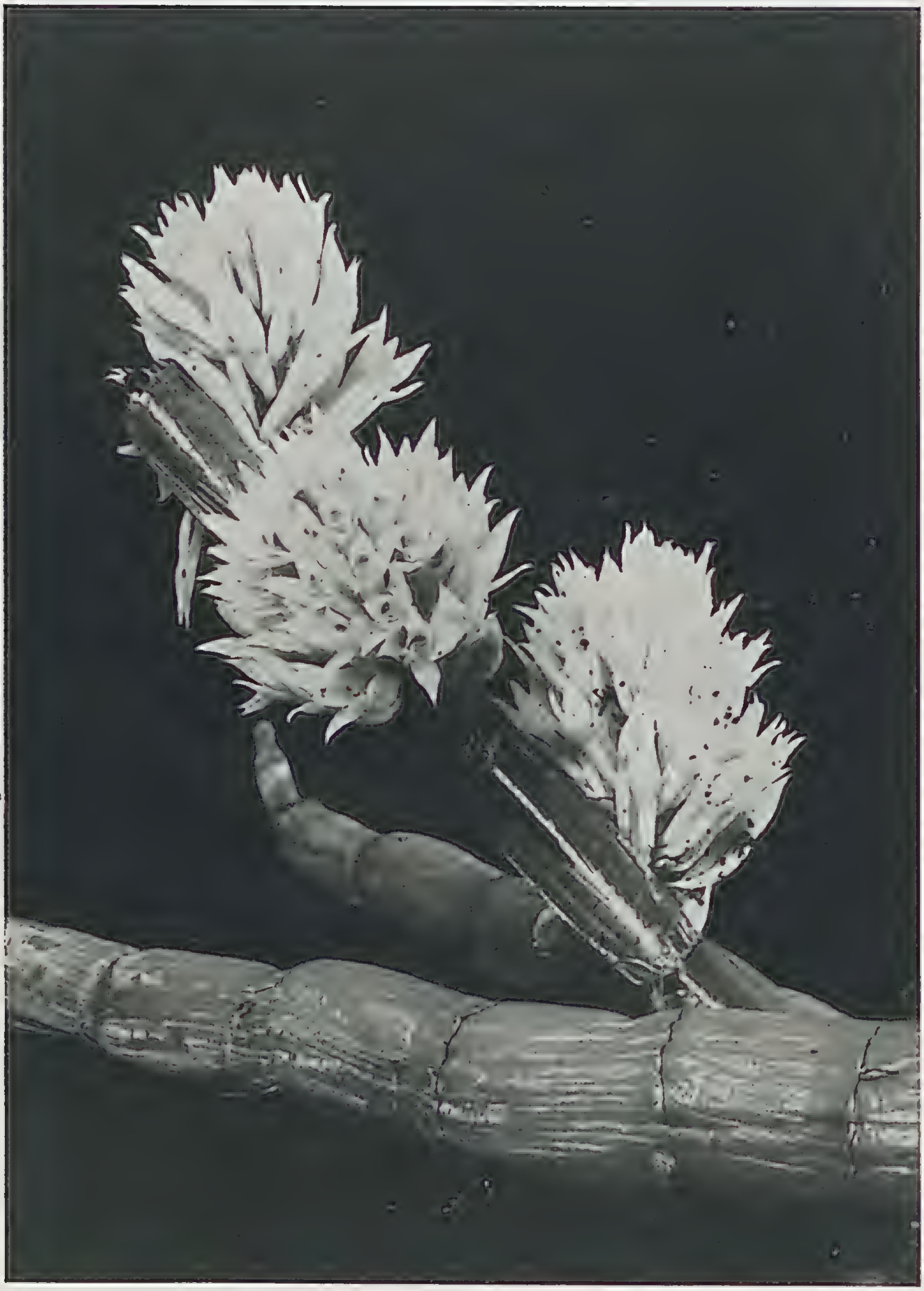

DENDROBIUM OPHIOGLOSSUM, Rchb.
Illustration approximately natural size
Grown by C. O. Dunn, Brisbane. Photo by Department of Agriculture and Stock, Brisbane.

Has Dendrobium ophioglossum been rediscovered?

C. T. WHITE, *Brisbane*
Honorary Botanist, Queensland Orchid Society

● In September, 1874, H. N. Moseley, the naturalist of the famous Challenger Expedition, collected a specimen of an Orchid closely allied to the common Bottle-Brush Orchid of North Queensland, *Dendrobium Smilliae.* This was named by Reichenbach as *Dendrobium ophioglossum* in the Journal of the Linnean Society of London, Volume 15, page 113, 1877. Up till the present the plant has only been known from the single specimen originally collected. According to Kranzlin, in his Monograph of the *Dendrobinae* in Das Pflanzenreich series of monographs, the single specimen at the Herbarium of the Royal Botanic Gardens, Kew, England, is in a very bad state of preservation, and Rolfe, the famous Kew Orchidologist, has written on the sheet that the plant appears to be identical with *Dendrobium Smilliae.* Kranzlin says, however, that he cannot share this opinion, and that as far as the one flower not wholly destroyed is in a condition to speak with certainty, the spur is quite different to that of *Smilliae,* being fusiform, that is, narrowed at both ends and swollen in the middle.

In our plant the spur is cylindrical or only slightly fusiform, and the labellum is pointed, not somewhat obtuse as described by both Reichenbach and Kranzlin. It is, however, too similar to separate the plant specifically unless I had access to the type. The present plant was gathered in the Solomon Islands and grown at Brisbane by Mr. C. O. Dunn, of the Queensland Orchid Society. If my determination is correct then *ophioglossum* has a wide range from the Cape York Peninsula to the Solomon Islands.

Kranzlin says he cannot understand the application of Reichenbach's specific name *ophioglossum.* It possibly refers to the shape of the leaf with a slight cleft at the top, although this cleft seems hardly deep enough to suggest close resemblance to the tongue of a snake.

Full description drawn up from Mr. Dunn's plant follows herewith:

Stems or pseudobulbs crowded, narrowed at base and apex and in consequence somewhat elongate-fusiform, up to 35 cm. long but flowering when much shorter, the older ones about 2 cm. diam. at the thickest part; older ones leafless. Leaves about 12, dark glossy green above, paler beneath, 14 cm. long, 2 cm. broad, lowermost ones very much smaller, narrowed somewhat at the apex and minutely 2-toothed. Flowers greenish-white arranged in dense lateral ascending racemes, borne on leafless pseudobulbs of the preceding year, 4-5 cm. long, 3-4 cm. broad; bracts triangular, green, thick, 3 mm. long. Ovary with the pedicel 1.3 cm. Dorsal sepal slightly shorter and narrower than the lateral sepals; lateral sepals ending in the lower part in a long spur; total length of flower including the spur 1.7 cm.; petals somewhat shorter and narrower than the sepals, but similar in form and colouring, all acute. Labellum narrow, disk green, apex white, triangular, acute. Column green, tridentate (after removal of the anther).

● Communications regarding The Queensland Orchid Society should be addressed to Mr. T. C. Harveyson, Hon. Secretary, Box 2002X, G.P.O., Brisbane, Q.

● During a naval engagement somewhere in the Pacific, the warship that Mr. D. C. Geddes served on was sunk. He writes to say "I got off without even a scratch as a souvenir, but we have to thank our friends, the Americans, that we are alive to-day." Mr. Geddes was given a spell in his homeland, Victoria, making good use of the rest by repotting his *Cymbidiums* and *Cypripediums.* He was present at the May, 1942 meeting of the Orchid Society of N.S.W.

● ***Index to Volumes 5, 6, and 7.***—For reasons of economy as well as utility, the contents of Volumes 5, 6, and 7, have been brought together to form a Composite Index. The war restrictions on paper have reduced the sizes of these volumes to the extent that when they are bound together the bulk is about the same as that of Volumes 3 and 4. Further, if the present restrictive regulations remain with regard to the use of paper, it is thought that it will not be expedient to publish another index until conditions return to normal. The Index is enclosed with this issue.

The Culture of Cymbidiums

Dr. J. A. VOTE, *Cronulla, N.S.W.*

● The following is an abridged version of the address given by Dr. Vote, at the February meeting of the Orchid Society of N.S.W.:

"It is as well to say, at once, that I am at variance with some of the generally accepted concepts of *Cymbidium* culture, and at first sight there will be many who will, perhaps, disagree with some of my statements but who, on more mature thought, may come to accept them, or at least, admit a basis of logical reasoning in the argument. For example, when I say that provided there is some clear drainage hole in the bottom of the pot, it does not matter in the slightest whether it is a quarter of an inch or four inches, as far as drainage, pure and simple, is concerned. There will be many who will regard that as a foolhardy statement, since practically all of you enlarge the hole, allegedly for this reason. Yet before this address ends I think you will agree with me about it, and I think, too, that it will be so with other statements which superficially appear just as foolish.

To begin, we will say that we have just acquired an adult *Cymbidium,* and immediately we have a problem. What shall we do with it? What about repotting it? We could see its root system and could straight away begin to grow it in our own particular compost, which all of us consider is the best compost for *Cymbidiums* yet devised by man or Nature. But there is need for careful thought.

Repotting. Depending upon how and when it is done this procedure can result in little or great damage to the plant's growth and its florescence.

A. ***When Not to Repot.*** It is often said (and come to be orthodox treatment) "repot when the new growth is 3 or 4 inches high" and it is here that I must first draw sword against established orthodoxy. Provided the time is not the depth of winter, and the plant having reached that stage by active continuous growth where three things have happened:—

(1) The dormant roots are growing again from their tips. (2) There are green root buds or even roots developed laterally from the sides of the old roots. (3) And sometimes new roots are appearing afresh from the base of the bulb from which the new growth appeared.

If you repot now, there is great danger of damaging the tender root tips and their gelatinous caps, protecting the cells providing root elongation. If this is done the roots stop growing, and if the damage is severe they may die back altogether. It may be weeks before the root system is re-established in full flood. If this check to the plant is considerable (and it may quite well be if the usual rough potting procedure is observed) the plant may be thrown out of its schedule of seasonal growth, because the check to the roots seriously impairs its intake of food proportional to the damage done. As a result when the seasonal time for flowering arrives the plant may not have made up the leeway of growth on time, and so it does not flower. So, in the warm weather of spring, summer or autumn, if a new lead is above the compost, *do not repot, if it can be avoided.*

If repotting *must* be done, because the plant is obviously sick, or grossly underpotted, or, the compost obviously hopeless, or exhausted, it may be done with the least harm by—hosing the old compost out and loosening the plant altogether, and repotting in a manner to be described later.

B. ***When to Repot.*** In the summer months, or the warm months of spring and autumn it will be found that most *Cymbidiums,* irrespective of their stage of growth, are not at rest, whether or not the latest bulb has just been made up, whether a new lead has appeared, or whether a flower spike is just showing. If in the warm months and repotting *must* be done, do it when the bulb is fully completed as by this time the root system is fully developed, and has fed the bulb to adult stage. It will be still active, in the warm months, supplying reserve energy, or preparing the bulb for a late autumn shoot, or developing the early flower spike, but at least its major job will have been done.

It is best to delay repotting to the late winter months, say, *no later* than the second week in August, in Sydney districts, in an average established hybrid. During the winter months the plant is either dormant or relatively so, and by selecting middle August you are just anticipating the new growth that surges in all plant life before spring comes, and what damage may be done will be more or less quickly repaired and the plant practically will move straight ahead. Even if the plant had made a late summer or even autumn growth, that growth will have stood practically still during the cold winter and the plant be relatively dormant. So, in late winter do not hesitate to repot, even if an autumn new growth is well developed and well above the compost, this being vastly different from a developing new lead in the warm months when growth is active.

Many will say, by the second week in August, the plant may have a flower spike, and even new growths as well as the flower spike. Repot it, if it is necessary. The repotting will not damage the flower spike nor the plant if done at this time and carefully done. The plant is still, relatively or wholly, dormant, the last stages of florescence being made on the reserves that the root system has stored in the bulbs. That is why at the end of flowering, the root system often being dormant, the bulbs shrivel somewhat, as their reserves are drawn upon. The cycle of that bulb is finished, new growth, maturation, and florescence, have been completed, and then after flowering comes rest and recovery of energy to start a new growth, or, if the new growth has started already, to urge it on more quickly.

I have seen a plant, bulbs made up and with four majestic spikes of flowers in which the root system had been entirely destroyed some months before the buds opened, flower perfectly, but the drain on the plant could not be replaced at all after flowering due to the lack of roots and the plant was virtually a system of green leaved bulbs and back bulbs. A bulb that is going to flower, nearly always shows the flower shoot first and the new lead later, and nearly always the new lead is later in appearing than it would be if the bulb were not in spike, the plant preferring to throw its energy into the development of the spike rather than the new lead.

So, as a general statement, defer repotting until late winter, *as a general working rule*, and repot at this time without hesitation whether the plant be in spike, or developing new leads, or both, if the plant should need it. If the plant is sick, the root system rotted, the compost obviously foul or exhausted, or the plant grossly underpotted, repot immediately at any time of the year as the check to the plant will probably be less than leaving it under its existing bad conditions, but repot very carefully.

As a general statement, no *Cymbidium* should be grown in a pot larger than will comfortably accommodate at the most any more than 3 years growth (preferably two years), which means that a *Cymbidium* should be repotted each three, or preferably two years. By this time the compost is exhausted, and the constant watering in summer will, together with the natural exhaustion by the feeding roots, have leached out a great deal of nutriment, or the compost will have degenerated so that it lacks drainage and is in danger of becoming sour. Small plants and propagations from back bulbs should be repotted each year. Now before the actual repotting other factors must be considered, and the first, after selecting a suitable pot, is drainage.

Drainage. When one asks a grower why he enlarges the drainage hole in the bottom of the pot almost invariably he will answer "for better drainage." He really does it for two reasons, the first to minimise the risk of a small hole blocking, and the second and main reason is for aeration, both, often being entirely negatived by standing the pot directly on the ground. For drainage pure and simple, if the hole be clear, the very smallest hole is quite adequate, the drainage really occurring in and depending upon the compost and crocking and the hole is merely the final exit for the drainage that occurs in the compost. An exit hole ¼ of an inch in diameter would pass gallons of water in a few minutes, if clear.

Demonstration. We have two pots, A and B, identical in size and shape, crocked equally and in the same manner, filled to the same depth by the same compost soaked in water for equal time. Pot A has a hole ½ an inch in diameter in the bottom, pot B has a hole two inches in diameter, sixteen times larger. Eight ounces of water were poured into each pot, and the amount passed through each drainage hole in 60 seconds was measured. The amounts were identical.

Pot C was a pot identical in every way with A and B, but the compost was different and the drainage hole was three inches across, in fact, scarcely any bottom in the pot at all. The drainage hole was 36 times greater than pot A, and 2¼ times as great as pot B. Eight ounces of water was poured into the pot, and the drainage collected and measured after 60 seconds. It was one twelfth of either pot A or pot B, which you will remember passed equal volumes.

No, the size of the hole, *per se*, does not affect drainage. Drainage occurs in the compost, and if it cannot pass through the compost, not even perfect crocking or the largest hole will influence it. The hole can only pass what passes through the compost when all is said and done. Drainage in practice depends upon the physical texture of the compost, not the size of the drainage hole, provided it is reasonable in size and clear.

Crocking. The crocking in the pot, together with the drainage hole serves three purposes. (1) Drainage, the crocks preventing the compost blocking the drainage hole of the pot, and (2) aeration, of the lowest, wettest layers of compost particularly, (3) some ventilation *through* the compost.

There will be hardly one among you who will not have noticed, on repotting an Orchid——*Cymbidium, Cattleya,* or *Vanda*—that the most dead roots are always in the central core of the compost and that this central core is always in the worst condition and always the wettest. This is all the result of diminished aeration. Decay of compost and of roots, begins and is greatest in this central core, for this reason above all others and if we could obviate it, especially in the epiphytal Orchids, we would obviously improve our culture and the health of the plant. It can be done by the crocking.

How to enlarge the hole and how to crock a pot is already known to you all. A few large crocks shot into the bottom of the pot is not crocking. Do it carefully and grade the crocks so that you finish with small ones that will not pass the compost, if it is soil, through the crocks to block the drainage hole. In the centre, build a central stack of crocks well up the height of the pot. In epiphytes it should almost reach the top. Now when the compost is filled in around the crocks, the central core is largely eliminated and the compost is of equal thickness and as near as possible equally aerated. In terrestrials the compost is in the form of an inverted U and in epiphytes it is almost a cylinder, closed at the top. The wet, rotten, sour, and badly ventilated core is eliminated, and there is ventilation through the pot. All parts are wet equally and dry equally as near as is practicable, and all roots are under the same conditions. Change of air, or ventilation through the pot is facilitated, danger from overwatering greatly diminished, and, remember, more Orchids are killed from too much water than from too little water.

How to Repot. The pot should be selected for size and prepared, and the compost ready mixed and dry. Take the plant to be repotted and lie it on its side, and hose out the old compost with a single stream strong enough to do this thoroughly but without undue force. In *Cymbidiums* it will be found that most of the roots will leave the pot, especially if the pot is well wetted before the hosing out is commenced.

Cut away all dead and broken roots. Cut away those bulbs older than 3 years, and it will be exceptional if any bulbs older than 3 years have any live roots. They are of use as back bulbs, but no use on the plant. Bulbs older than 3 years will never flower, never shoot unless the rhizome is broken, and are a drain on the plant's constitution if left on the plant. Make them work as back bulbs, and grow new plants, and keep the original plant juvenile. Divide the plant with these ideas in your mind, if division is necessary.

Arrange the roots *over* the central pile of crocks, or if the roots are all sound and keep the shape of the old pot, stand them on the central pile of crocks. Arrange the plant so that it is a reasonable distance below the rim of the pot, holding it in this position with one hand, the oldest bulbs being nearest to the edge of the pot. Fill in the *dry* compost around the sides and then shake or bump the pot until the compost filters in and around the roots. Add more compost, still holding the plant at the desired level and position until the plant is firm. Add more compost to just cover the base of the plant, and bump and shake the pot to settle it. Never ram the compost and never pull the plant. Clean and spray the leaves with approved insecticide and trim broken and dying leaves. Do not peel the back bulbs of their protective covering.

After Treatment. Now, no matter how carefully you have repotted the plant it has suffered some damage, greater or less, according to your experience and skill. Do not water for 4 or 5 days and stand the plant in a cool moist place. The compost being dry and the pot aerated, abrasions and fractures of the roots will heal over. It is a mistake to water immediately on repotting because these abrasions and fractures rot, and if you could knock the plant out, after 3 or 4 weeks, if immediate watering after repotting is your custom, you would be surprised at the damage to the root system, many being dead or dying, just because of this fanatical hurry to water. Shrivelling, after repotting, is often due to this immediate watering, as well as by bad handling in repotting, or failing to select the proper time to repot. Often it is made worse, because the shrivelling often induces the grower to water even more in an attempt to correct it. Remember, plants are knocked out of their pots in England, wrapped, and travel to Australia and have good live roots after weeks or months of dryness. Shrivelling is, in actual fact, due to the loss of water through the leaves in excess of water that can be taken in by a dead or dying root system or a dry root system. Shrivelling nearly always means dead roots rather than dryness, and if you water to correct it without first ensuring that the root system of an Orchid is not only dry but also sound, you surely make it worse.

After the 4th or 5th day water the plant *thoroughly*, and if the compost settles down add a little more. Let the pot dry out and remain dry for 2 or 3 days and water again, and let it again dry out for 2 or 3 days. After this you can safely water to keep the compost moist, *never continuously wet*, and do not be afraid to let the plant dry out, for a time, short of shrivelling from dryness until *active* new growth is observed. The reason for this advice is as follows: The new growth is born from, and supported in its early life, from a bulb and it is a mistake to continually water an established plant, with roots, in an endeavour to start it off in new growth or to re-start an autumn new growth that has stood still during the depths of winter. The roots will not be growing until or just before the new growth starts, or if started in autumn until it becomes active. They may have been damaged by repotting. They cannot cope with excess water and if the compost be kept continually wet you will only succeed in rotting them.

If you persist, to the point where all the roots are dying or dead, you will really have a system of leaved back bulbs, one of which is making new growth and you will have lost much valuable time in building your plant. It must be obvious that you cannot treat a fully leaved, repotted plant with a root system, inevitably damaged to some extent and therefore in danger of rotting, and so of losing its water content through the stomata of the leaves as you would a back bulb with no leaves and no roots. Yet it is often done. If the new growth has started, *and in active growth*, after observing the precautions subsequent to repotting, it can be watered to keep it continuously moist, but never continuously wet.

Composts. Unfortunately *Cymbidiums* will exist, and even grow in practically any compost, and composts vary from the super excellent mixed with cunning care and the secrecy of a *bon vivant's* cocktail, down to rubbish or dirt, used with no care at all. The one grower will attribute success to a special mountain soil, a layer of oak leaves at the bottom, or pine needles on the top, or charcoal ground so big and no bigger, mixed throughout, the other observes no elaborate ritual and no preference for materials as long as the end result looks like soil. I think that neither is correct, but at least the former has interest and thoroughness to commend his method.

In actual fact the compost does not matter nearly so much as is generally thought, and *Cymbidiums* will grow in dozens of composts equally well. What really matters most is the selection of your compost with regard to the conditions under which you propose to grow the plant, viz., situation, watering, light, aeration, size of pot, etc.

It is the physical texture of the compost that matters most in that it must be suited to the situation and conditions of growth. If the texture is such that the compost can be kept continuously damp, without being continuously wet while the plant is in active growth in the conditions under which you grow it, and it provides aeration and drainage, and it is reasonable in quality and quantity for plant life that is terrestrial or semi-terrestrial in habit, then that is all that is required of it.

Most composts are too rich and there is too much of it. Those are the two commonest faults. Bad drainage and poor aeration often accentuate these failings. Later on, due to neglect to repot when repotting is due, the exact opposite often become the worst faults, the compost being eaten out, and too little, the pot containing little else save roots. If you reflect, you have not seen an Orchid of magnificent noble stature, or of extreme rapid and large leafy growth. There is nothing of the noble oak about an Orchid. Orchids need but little food and need that little slowly. Many are pseudobulbous and can and do live lengthy periods under almost famine conditions using the material stored in their bulbs in the years of plenty.

Our own native *Dendrobium speciosum* can be seen growing in huge masses, on apparently bare rock, the decay and detritus of their own bulbs together with a minimum of bush litter, supplying the food for the huge plant. Remember the *Cymbidium's* insignificant stature, its relatively small and certainly slow growth, its long lasting qualities even away from all food (e.g., back bulb) and do not treat it as you would a gross feeder, and a rapid grower, with heavy leaf production such as a cabbage. Yet I have seen many a pot growing three *Cymbidium* bulbs that would grow a fine cabbage or a fine dahlia, the weight of which would be twenty times that of the three *Cymbidium* bulbs.

The method of potting I have advocated, partly overcomes this tendency to over pot and over feed, by reducing the compost and giving more control over the degree of wetness, so that food can therefore be better controlled, food only being assimilated by the roots when dissolved in water. Older growers will remember the dictum, "To induce flowering the plant must be under potted." There was something in that argument for these reasons. *Over* potting, if the treatment were bad, meant almost continual wetness, rotten roots, and poor physique, the result being starvation amidst plenty, and the plant did not flower. If the treatment was good, over-potting meant a superabundance of food which the good root system could absorb, and resulted in lush vegetative growth with no inducement to increase the species by flowering, and its natural sequel, seeding. These days it is proven by experiment, and generally conceded that sunlight will induce florescence partly because the sunnier open conditions partly correct the faults of overpotting, and partly because the plant is better matured, its bio-chemistry being aided by the greater light value.

So, use what compost you personally prefer, but select and mix your materials with care, and after reasonable deliberation.

Do not use your friend's mixture and expect from that alone to equal his success. Your conditions of growth may be entirely different and unsuited to that compost. If you use his compost, also you must grow and treat your plant exactly as he does, to achieve his results. Success in *Cymbidiums* is not to be found alone in the magic word—compost. The compost I use is as follows—2 parts tan bark (not rotted to a soil texture, but still obviously bark), 2 parts of leaf mould (not gummiferous or resinous leaves), 1 part of very, very old cow manure broken down so that it cannot be recognised as manure, 1 part of *coarse* sand, and ½ part coarse crushed charcoal. I do not think it is any better than any one of a hundred other composts, and I do not believe that there is any magic in any one ingredient. But, the above compost is of good texture, drains well, will keep moist, but you cannot easily keep it wet under open air, sunny conditions. It provides ample food for two years, if a pot is selected large enough to hold two years growth, and its use, together with the other conditions of culture, resulted in over 90 per cent. florescence in adult plants in my care for two years or longer.

Culture. Well, now, having bought the plant, and the time having come to repot it, the pot selected, properly crocked and aerated, repotted it in a chosen compost, and refrained from the temptation to water it immediately, first where, and second how, shall we grow it,

(A.). ***Where to grow it.*** Its position and treatment for the first two weeks after repotting has already been dealt with. What follows? By now it is generally accepted that it must be grown in a situation that gives *good sunlight*, that is, if you desire it to flower and not simply have it as a foliage plant. Why it should be grown in good sunlight is a large question, and one on which I previously addressed you. Suffice it is to say that the plant needs sunlight, not just light, to induce adequate maturation of the new lead into the new bulb slowly and continuously as it grows. It is a question of photosynthesis, chlorophyll formation and chlorophyll activity, and the bio-chemistry of the plant, light of the intensity of open sunlight for at least some fair part of the day being necessary to ensure that these bio-chemical changes occur in adequate quantity, and with adequate speed to produce maturation of the bulb by the time seasonal florescence is due to occur.

Remember a Bougainvillaea will make luscious leafy growth in *shade*, but will not flower. To flower, it needs stronger light, *sun* light and an adequate number of sun *hours*. It is so with your *Cymbidiums*. The old idea of growing the plant in shade or relative shade, and then, when the bulb is making up, suddenly withholding water to starve it or "mature" it is quite wrong. Some time ago, I showed you X-ray pictures of a *Cattleya*,* the new growth of which was nine weeks old, and which had no roots whatever of its own. In the X-ray the flower sheath could be seen and two buds, nine months before it was due to flower. In other words, that sheath and those buds must have been initiated and developed to that stage by the food reserves matured in the older bulbs, the new lead having no roots. A daffodil grown and matured in the ground one year will flower the next if grown in pure water, but the following year the same bulb will not flower. *It is the maturity of the last made bulbs that largely influence florescence in the new bulb and that florescence is determined early in the life of the new lead and its completed development is carried on by new roots from the old bulbs replacing the energy withdrawn and later on by new roots from the new lead itself.*

That is why a *Cymbidium* must be established and matured before it will flower. You may take a badly grown plant and grow it wonderfully well under healthy hardy conditions, and produce a mature bulb for the first year, but it may not flower. In the second year it will, because there is enough maturity and energy stored in the first bulb you have made to start florescence in the new lead in the second year of your culture. So realise these things, (1) whether a lead will flower depends to a great extent on the maturity of at least the bulb immediately behind it, and (2) whether a lead will flower is determined early in its growth. (3) It may be going to flower and you can produce miscarriage of the flower by bad treatment. (4) Flowering is comparable to pregnancy, an attempt to increase its species, and the idea of starving any living thing when pregnant to make it produce its progeny is wrong. (5) A lead from a back bulb will occasionally flower (I showed four at the Society meeting), if the plant is well grown under conditions producing good maturity, especially if the back bulb from which it started is vigorous and young from a well-grown and well matured plant. However, this is a digression, but it, at least, goes some way in explaining why a plant should be grown in good sunlight. To more fully explain and argue it is beyond the scope of this address.

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*These will be published in the September issue of the A.O.R.—Hon. Ed.

Now this matter of a sunny situation is not as easy as it sounds, and I have seen plants grown under a choko vine, passionfruit vine or grape vine in real shade, or under a densely foliaged tree and yet described as being "grown in the open" because they received a few hours early morning or late afternoon sun. This sunlight is of poor actinic value and insufficient in quantity and quality.

On the other hand I have seen a shade-grown plant suddenly placed out in full sun, in summer, to blister its hide off. It burns, naturally, and the grower decides against sun. In addition he probably kept it dry. Imagine your own protected skin, exposed for one day's sun, in a Sydney summer, and you get a fair idea of what you are asking your *Cymbidium* to endure.

If your plant has been shady grown, start it off with sun in the winter or early spring, and get it used to it and in hot sunny weather, especially with hot drying winds, see to it that the compost is not bone dry. Think—and use discretion.

The only practical way I can tell you of judging suitable sunlight if you are in doubt, is as follows: Take a sheet at *noon* and spread it over your plants. The shading above should dapple the sheet so that about one-third is shade and two-thirds is sunlight. If these conditions of sun and shade on your plants obtain *at noon* when the shadows are small, you can readily see that the shading will be greater before and after noon, when the shadows grow longer. Even this does not take into account the shade that one plant affords another by the leaves, this shading being greater the closer the pots are together.

So much for situation, broadly speaking. Now the details. If possible, perhaps at least for your better plants, raise them 18 inches off the ground on hardwood frames, the plants being stood on slats, so that the drainage hole is between the slats, allowing ventilation. If possible, fill in between the pots with coke or tan bark on wire netting so that the sides of the pot are cool and moist and not baked should the compost be allowed to dry out. It helps humidity, it prevents reflected glare and it stops burning of the roots that come to the inside of the pots. It is a refinement, admittedly, but worthwhile for valued plants. If the plants are stood on the ground the watering softens the ground, and the weight of the pot forces a plug of earth up into the drainage hole. Thorough ventilation of the compost, to keep the roots hardy, is prevented, worms help to block the hole, and drainage is impaired. If the ground is dry or sandy there is considerable reflected glare and heat. Have you ever walked on Sydney beaches or Sydney pavements barefooted in summer? Slugs and slaters find ready entry if the pot is directly on the ground.

(B.). ***How to Grow It.*** The culture is broadly the same as for every other Orchid. The physiological cycle is new growth, maturation during growth, and after growth, florescence, and finally rest. The first stage is new growth. As soon as new growth appears, or even before, root activity has started in the roots from those bulbs having live roots. The tips grow, lateral roots form from the old roots, and new roots may grow from the last made bulb. Knock out an established species you do not particularly value and check this statement for yourself. At this time the new lead has no roots of its own, but the plant is in active growth. The new lead is drawing on the leaved back bulbs, and this energy withdrawn is being replaced by the growing roots of these bulbs. This energy requires food. Roots can only assimilate food in solution and the solvent is water. So, as soon as new growth appears, begin to water, gradually at first, and as the root action increases proportionately increase the watering until finally the plant is kept almost continuously damp, but never continuously wet. Continue this watering until the bulb is fully made up and after, while the warm weather lasts, to store the food into the bulb and develop the spike if it is going to flower.

Often it will make autumn new growth if the weather is warm, so get this growth advanced for it will stand still, or relatively still in the winter, and start to re-grow in the spring. While the weather is warm, even in May, the roots are active and some growth occurring. In the winter, avoid the compost being continuously wet, as you will rot out the roots, and in the spring the plant starts far, far behind scratch. Water not at all, or only if you notice the bulbs shrivelling and know that the roots are sound. Be sure of this latter, because shrivelling more often occurs from the loss of a root system than from dryness. The flower spike, if the bulb is flowering, will not require that the plant to be excessively watered during winter, and in fact, this would harm it. The roots rot, and the bulbs being quite exhausted after the spike is finished shrivel badly, because the exhausted food reserves cannot be replaced by an adequate root system.

The Second Stage of Maturation. I have dealt with this already under "Where to Grow It."

The Third Stage is Florescence. Every *adult established* plant that has been well grown, under conditions that ensure adequate maturation for at least two years can and should flower. If it doesn't then we must seek the reason why. Some plants, e.g., *grandiflorum,* are so difficult to acclimatise to our conditions that flowering is naturally shy. For example, it may need more cold than our district can naturally supply in order to mature and rest it.

The Cause of Non-Florescence are basically two.

(1) The cultural conditions, for the last year or two years, have been too congenial. The bulbs may be large, the leaves long, narrower than they should be, weak and "floppy" with no fibrous tough strength. The plant is soft, unripened, unmatured, flabby and incapable of the gigantic task of flowering and its anticipated sequel of setting seed, and so it skips the task impossible to its overfed flabby physique, leaving it to a future generation of bulbs. Treat the plant rough, *reasonably* rough, for a year, or two years may be necessary. Give it more sun, more air, less rich compost. Make it live hard to use its food to produce mature, good wood. Mature it.

(2) The second basic cause is the exact opposite of the first—starvation. In this case the conditions have been *too* arduous. This plant has just enough energy to keep alive and has never been fed enough to reach a strength capable of reproducing itself by flowering and a possible seeding. It can maintain itself only as an individual and that by very weak growth.

The large increase of its species by seeding, which first means flowering, is not for it. Its immediate concern is to survive. A large family, from seeds, is not for it. An indifferent new growth is all it can manage to continue the race. An annual having no other course open to it because it is an annual, may produce a poor flower and poor quality seed, in an attempt to save the species.

Now the causes of this starvation may be: (a) *Neglect to repot.*—The pot consisting of eaten out, exhausted compost and a mass of roots, often excessive, in an attempt to find the food the plant needs. (b) *A mass of back bulbs.* —Needy distant relatives, drawing their sustenance and maintaining life, at the expense of the younger bulbs, which are constantly kept poor and "on the breadline"—unable and unwilling to produce flowers. (c) *Loss of the root system* by—(1) Watering immediately after repotting, watering continuously in winter. (2) Compost of bad texture, bad drainage, poor aeration resulting in wet compost, with the same nett result as overwatering. (3) Too much and too rich compost—also giving the same effect as overwatering. (4) Manuring. (5) Damage and rough handling in repotting, especially by ramming the compost or pulling the plant. (6) Death from long dryness and exposure to hot sun (rare). (7) Attacks by insects and vermin. (d.) A condition of temporary starvation by selecting the wrong time to repot—the plant receiving an inevitable check, so that it cannot make up its leeway in growth and maturation by the time its normal flowering season arrives.

The Fourth Stage is Rest. Rest depends very largely upon the climatic conditions. In a *Cymbidium* bulb that is not flowering, rest occurs when or just after the bulb is fully made up. This rest may be quite brief, if the weather be still warm and the bulb may begin a new vegetative growth in the autumn, almost immediately the bulb is developed. Whether this is so or not, in the cold weather of late May, June, July and early August, the plant is at rest, or practically so, the growth being almost nil.

If the bulb is in spike, it is still in rest during winter, the last stages of developing the spike being made by the reserves in the bulbs. It is this that is the strain on a plant and the reason why, after flowering, there may be some shrivelling, the degree depending upon how good the reserve storage had been in the bulbs and how quickly the energy withdrawn can be replaced by a good, or not so good, root system. If unseasonable warm weather appears during winter, growth will recommence and the rest is over, even though it may be a false start. This can be seen in the unseasonable flowering of shrubs and fruit trees induced by a false "Spring." If cold weather subsequently sets in, and lasts long enough, the plant again goes into a relative rest.

In any case, when continuous warm weather appears, vegetative new growth begins, either of the new lead made in the autumn (or even winter, in warm sheltered positions where rest is brief or practically absent), or by the appearance of an entirely new lead or leads. The cycle is now completed, and once again we commence our treatment, designed to grow the plant unhurriedly, hardily and well, not necessarily lavishly, which is just as bad as in poverty.

Pruning. For a variable time, the new lead from a *Cymbidium* has no roots of its own, but depends entirely upon the bulbs behind it. If the root system of the plant is good there is no shrivelling of these bulbs because, as we saw, when new growth starts root action recommences concurrently or just before. This means the energy is re-supplied as fast as it is withdrawn, the process being continuous. That is why your new lead, from an established plant with roots, is better than your new lead from a back bulb with no roots. If, however, the plant has a poor or no root system, shrivelling soon commences and the new lead, feeling its food supply giving out, and its existence in danger, makes its own system of roots earlier than it otherwise would.

If, in addition to having no roots, the bulbs are fully leaved (sometimes the case when divisions of plants are bought), shrivelling may be very bad because the leaves transpire water vapour through the stomata. In this case, to conserve the water content of the bulb, it may be advisable to prune the leaves to prevent this, just as every gardener "striking" a cutting of a shrub prunes off the leaves, or as the vegetable grower cuts the leaves short when transplanting large spinach seedlings. But this is a digression.

Well, then, when the new lead is making its own root system less and less sustenance is being drawn from the bulbs, until finally, it stands upon its own feet entirely. When this occurs, since the new lead and the old bulbs, are continuously connected by the rhizome, the old bulbs, with roots, use their food themselves to restore their energy and also the new lead may contribute and repay what it borrowed in its infant stages. This energy is re-stored to ensure the plant against some possible future damage or future starvation, when it can carry on in the case of the latter, or start new life in the case of the former.

But all of you will have noted that it is rare to find live active roots on bulbs older than 3 years. Yet these bulbs are plump and alive. Their life and condition is maintained at the expense of the younger bulbs which have roots. In other words bulbs *more* than 3 years old are a drain on the plant and may hold back its vigorous growth, in quantity and quality, and its florescence. These bulbs will never flower, and their only purpose is to safeguard the plant against prolonged starvation and this should never occur in cultivation. In any case, the bulbs younger than 3 years will do this for a very considerable time.

So cut old bulbs away—prune the plant, and keep it juvenile. You prune your shrubs and roses, etc., to obtain vigorous new growth and more and better flowers. Do the same with your *Cymbidiums.* Do not allow your young bulbs to support a host of distant, needy relatives, until they are so hard pressed that they have only a bare existence, progressively poorer in new growth and in flowers.

Vegetative Propagation. In actual fact, these old bulbs have another function besides insurance against starvation. If the plant suffers actual damage, those bulbs behind the site of damage can use their stored reserves of energy to start new vegetative growth from dormant vegetative "eyes." This fact can be utilised in vegetative propagation from old back bulbs. When they are cut from the plant, individually or in groups, new plants can be started from them. The optimum time to cut them and start them off is repotting time—middle August in Sydney. If the plant is not to be repotted, they can be "pulled" to break the rhizome or the rhizome completely cut through and the bulbs left in the pot. In this case, the conditions of starting new growth are liable to be too severe to obtain the best results.

It is better to completely sever them from the main plant at repotting time which anticipates warm spring weather, and repot them separately as single bulbs or in pairs. The growth may be a little stronger from a pair of bulbs than one bulb.

The method of striking the old bulbs is easy, especially if the old bulbs are not too senile, and one to four new growths from each back bulb is possible. They need only moisture and warmth and will strike even in garden soil provided these requirements are met continuously. A safe and quicker method, giving a greater percentage of good results with multiple or stronger new growths is as follows:—

(1) Do not peel off the old, protecting leaf bases covering the bulb. They cover and protect the vegetative eyes from excessive contact with water, pests and light. They are designed by nature to protect, so leave them. (2) Make up a tray, well drained at the bottom, and fill it with 3 or 4 inches of live moss, or a mixture of 2 parts tan bark, 2 parts chopped, clean fibre, and 2 parts leaf mould. It should not be packed tightly. (3) Insert each bulb, vertically, to one third of its depth into this, base downwards. Place in the glass house, preferably, but not essentially, and keep warm and moist. (4) Start your back bulbs early in the season so that you give them the whole growing season of summer and autumn to develop strong leads which will make up into small bulbs early in winter. If your shoot begins late in summer or autumn, it will follow the seasons and be dormant in winter and will not make up into a bulb, but will re-grow in spring, bulb poorly, and break into the second season's growth before it gets in step, and is behind compared with a lead from a back bulb made *early* in spring, for perhaps 2 or even 3 years. (5) When the new lead shows its first roots, take the back bulb out and repot it as previously described. Do not overpot it, and do not use rich compost to make it grow quickly. Do not *over* water it. If you lose the new roots on the new lead, the lead is checked considerably, may even die, and you may be back to starting off with a back bulb again. (6) Grow under shelter, preferably in the glass house, for the first month. Do not push it straight into direct full sun immediately on repotting. A few days neglect or extreme weather may harm it. Give it good light, in a sheltered position and some care. One or two months after repotting move it into a position where it gets morning sun and gradually prepare it to take its place with the adult plants in later summer or autumn.

Intensive Vegetative Propagation. This is used where the back bulb has shot from only one dormant eye and the plant is highly regarded, and you want as many growths as possible from the one back bulb. The method should only be used when the original back bulb used is vigorous, fairly young, and has started its growth in spring or early summer.

The method is as follows:—When the first growth has rooted well in its pot, usually 2 months or so after repotting, and before the roots are clinging to the sides of the pot, very carefully hose out the compost. Very carefully separate the new lead from the back bulb and repot it in compost that is dry. Leave it for 2 or 3 days, and keep well sheltered. On the third day soak the pot thoroughly and let it dry out. Then soak it again and shelter the plant for a few weeks. The back bulb is started again in the usual way from a second eye. This process may be done until the bulb is exhausted.

Pests. *Cymbidiums* are not troubled greatly with pests. Various scales, and thrips can attack them, especially young plants grown under shelter, but can be controlled by the usual sprays. Earthworms, slugs, snails, and slaters are a trouble, especially if the plants are grown directly on the ground. They can be controlled to some extent by raising the pots off the ground and by the usual remedies known to all gardeners. By far the worst pest, is the dread mystery disease of *Cymbidiums,* the cause of which is unknown, but is said to be a virus. Many and varied are the alleged causes, and many and varied the treatments, but when the disease is established none is of avail, and the grower is lucky if he can save even one back bulb. I, personally, believe it to be a virus, and I personally know of no treatment for it. The first symptom is slowing down of growth, and a general unhealthy appearance most marked in the new lead. Next the plant becomes "sweaty" in leaf axils and unopened leaves of the new lead. Spots appear on the affected parts, the leaf becoming semi-transparent in these spots. These later turn black and the leaves of the new growth become yellowish, finally turning black. The disease affects the whole plant, the bulbs of which become spongy, wrinkled, and yellow. If the bulbs are cut, they are discoloured brown on cross section and appear watery and semi-transparent. The disease usually is first noticed in the younger portions of the plant and spreads back to back bulbs. If the plant is knocked out the roots are rotten or in poor condition. If the condition is noticed early, a back bulb may be saved. As I said, the cause is probably a virus. Whenever I have seen the disease occur the plant has always been too wet for too long, combined with one or all of the following—overpotting, overshading, over rich compost, or manuring. If these conditions are not the primary cause then at least they are a predisposing cause, probably acting by robbing the plant of its natural vitality, and lowering its resistance to infection.

Manuring. My opinion on manuring of *Cymbidiums* must be obvious to all who have noted the general tenor of my remarks on culture. As I said before, most Orchids are insignificant in stature. They are slow growers. The growth is not large. The growth is long lasting. Therefore, the food needed to make the growth, or make good the wear and tear of tissue is not great. There should be no need to manure if the feeding is reasonable and continuous, and the cultural conditions good. In fact, most Orchids could do with much less water and much less food than they customarily get.

I often think that an epiphytal Orchid, in moss and fibre, goes "off" when the compost is rotten and degenerated, partly because of the rotten roots due to continual wetness owing to the poor physical conditions of the compost, but partly, also, because the compost has degenerated into rich humus, acting as a manure, and hastening root rot. Also, most growers blithely use manures with no expert knowledge of what constituents are in the manure, or fertiliser, or how they act, or when they act. Neither have they any real knowledge of how much, if any, of any particular ingredient is needed by the plant. Neither do they know how much fertiliser has been used by the plant, and how much left available, when the time arrives for the second application, and so cannot avoid any summation effect or "building up" of the concentration in the compost. Manuring is very much like blind flying, and has all its dangers. It is trial and error—and mainly error. If it *must* be done, do it only in terrestrials, do it only in those Orchids which make a growth and are re-started again the following year, such as *Calanthe, Thunia,* etc., do it only when the plant is in active growth, or at such a time that the fertiliser will be available when the plant is active and not dormant, and use only substances of very low grade manurial value and of very slow action.

In this address I have tried to avoid empiricism, the "rule of thumb" culture of *Cymbidiums,* and invest it with some thought, supported by some argument. The argument to some may not be sound. Even if this is so, in their judgment, at least it may stimulate controversy and thought, keener observation, enthusiasm and experiment, and it is by these factors, and these alone, that we will, in the end, know something of *Cymbidium* culture. Unreasoned hit-or-miss effort, will not advance us. If, in this address, there is *one* idea, that is some step towards that progress, then I am more than satisfied.

At the March meeting of the Orchid Society of N.S.W., a discussion took place on the foregoing address given by Dr. Vote at the February meeting, the following being a report by the Hon. Secretary, Mr. T. H. James.

Mr. C. Cambourn commented favourably on Dr. Vote's address, and said that he wished some such instruction had been available when he commenced to grow *Cymbidiums.* However, he questioned the wisdom of Dr. Vote's remarks on the time of repotting, the method of repotting with a central mound of crocks and the compost. Dr. Vote, it will be remembered, gave the time to repot as *not* later than the second week in August—Sydney districts—as a general average rule for the setablished average hybrid. Mr. Cambourn referred to the varying habits of many species, e.g. *C. giganteum* and *C. Traceyanum* flowering as early as April, and others such as *C. Mastersii* and *C. eburneum* flowering a little later, and *C. Lowianum,* which flowered very late. To him it seemed that a general instruction could not apply to repotting at such and such a time for those plants and their hybrids because of this variation. Mr. Cambourn also questioned the necessity to build a central higher mound of crocking above the level of the rest of the crocking to provide, together with an enlarged drainage hole, better aeration. He claimed that aeration of the roots was not an essential matter, and that in nature the roots were not aerated. He also thought that if aeration were necessary it could be obtained in sufficient degree by using smaller pots.

Referring to compost, Mr. Cambourn claimed that its nature was a vital essential, and that the materials should be such that they decomposed slowly, and the compost should include a slow acting food agent such as bone meal. He was of the opinion that there should be sufficient food in the compost to last for a considerable time because the plant would require its greatest food in its second year, due to the natural increase in size.

Dr. Vote, in reply to Mr. Cambourn's query as to the time of repotting, stated that there was something to be said for Mr. Cambourn's contention. In his address he had tried to get down to a general working rule that would help those not yet expert in *Cymbidium* culture. There was one golden rule that governed repotting, and that was to *avoid repotting* after the new lead had appeared above the ground, if the weather was still warm because by that time root action was active. The time to repot, then, was when the last made bulbs were fully made up and no new growths had yet appeared. This condition may be found in any month for any individual plant and if found in the autumn months the roots even then would probably still be active, due to the weather being still warm, but if one were driven to make a general statement for those not expert, then the time to repot should be given as *not later* than the second week in August. His reason was as follows. In the early spring all plant life felt a seasonal urge to new growth and emerge from the longer or shorter period of dormancy that every plant relatively experienced in the depth of winter. If a *Cymbidium* makes a new lead in March, then the best time to repot is just before it makes the new lead, but failing that opportunity, the new lead would continue to grow while the weather was still warm but would, more or less, stand still in the depth of winter, say, in June and July. It could be repotted in either of these months while it was dormant but the better time to repot would be *not later* than the second week in August, because if this time were chosen it would, a week or two later, have the warm spring and move straight ahead. If repotted in June or July, it would need to stand rigorous weather conditions immediately after it had suffered some damage by the repotting no matter how slight that damage may be.

With reference to Mr. Cambourn's second point regarding aeration, he did not agree with him and said that all Orchids needed aeration to a greater or lesser degree according to whether they were more epiphytic or terrestrial in type. He claimed that even in terrestrials the required aeration was available in Nature, the roots being free to wander wherever they wished to find their own suitable conditions. We, on the other hand, grow them confined in pots as a matter of necessity. He called attention to the fact that any Orchid potted in the usual conventional manner was always found to have a central core, which, on repotting, was found to be the most wet, the most rotten compost, and to contain the most dead roots. This was due to lack of aeration of the central core of the compost. He drew attention to the fact that the method of potting and crocking as described and illustrated by him eliminates this central non-aerated core and the compost in the pot was of equal thickness and equally aerated, and no root had any greater opportunity to rot than another.

In reply to Mr. Cambourn's remarks on compost, Dr. Vote agreed that it should be durable and sufficient, but said that most composts were prone to be too rich. The compost advocated by him was rich enough and would last long enough to feed a *Cymbidium* for two or even three years at a pinch, if the pot selected was of the size advised, and the plant was crocked and grown in the situation he suggested and, at the same time, would not be overfed, badly drained or under aerated. He drew attention to the fact that no Orchid was of a majestic stature or of quick abundant leafy or woody growth, and none was ever a gross feeder. He drew attention to the disastrous effects experienced by even expert growers in attempting to overfeed, by too much compost, too wet a compost, too rich a compost or by manuring. If, by these attempts, the plant did not actually meet disaster but coped with the overfeeding, it very often ran to rank luscious vegetative growth rather than florescence and, further, due to its softness, it was more liable to future harm.

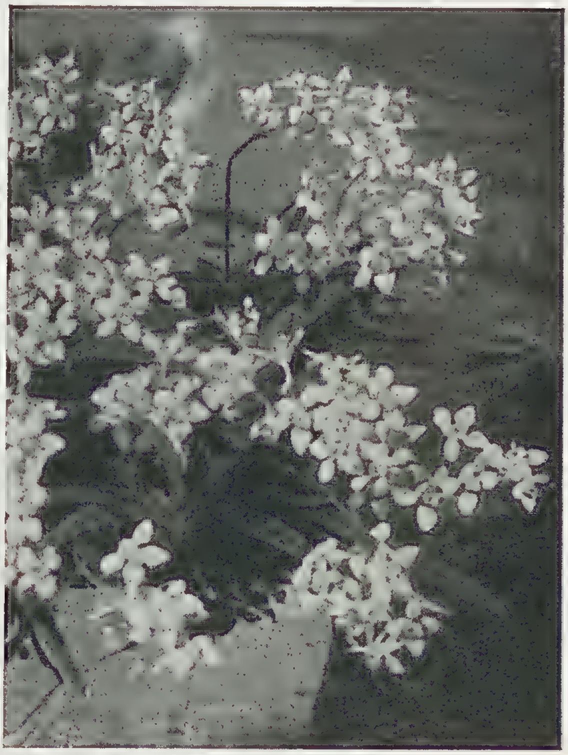
Dr. Vote said that *Cymbidiums* were pseudobulbous, and the bulbs contained food reserves supplied to them by the roots of those bulbs having roots. The reserves in those bulbs, especially those not over two or three years, made the new lead, and grew it on to considerable development before the new lead produced its own roots. He had X-rays of half grown *Cymbidium* leads with little or even no roots in which the flowering eye could be detected leaving the base of the lead. In unestablished plants the root system to the new lead is developed earlier because it feels its existence is threatened. The importance of the old bulbs and their live roots behind the new lead was insufficiently realised. In the *Cattleya* family a new lead could often be seen fully made up, in sheath, or even in flower with no roots from it, so that the whole new growth, including the flower, was a result of the old bulbs and their roots.

In the propagation from back bulbs which have no roots the energy taken out by the new lead cannot be re-supplied by any root sytem on the old back bulbs and there is usually insufficient in the old bulb or in new lead to produce flowers though it will occasionally flower and such has occurred in plants exhibited by him at previous meetings.

Mr. Adamson's chief query was the time of repotting. He said that he repotted at any time of the year and thought nothing of doing it twice or even three times a year, and quite irrespective of whether the plant was in active growth or not. He exhibited three plants in which this had been done, and they looked very well. However, he said, he usually repotted in autumn, especially if a plant showed no signs of flowering. His method was to wash out the compost with a hose, place the undisturbed roots in a larger pot and fill in dry compost in and around the roots up to the base of the plant. He agreed that Dr. Vote's idea of using dry compost and refraining from immediate watering might be a good one.

Dr. Vote, in reply, pointed out that Mr. Adamson "got away with" frequent potting of plants in *active* growth because of the method he used of hosing out old compost, his care and expertness. It entailed a minimum of damage to an active root system, but still *some* damage. The method was, in effect, a refinement of "potting on" where a plant is knocked out of its pot and, with no sort of root disturbance, transferred to a larger pot. Hosing the old compost out should always be the method adopted, and the whole procedure of Mr. Adamson's was not uncommonly used for small plants propagated from back bulbs or for small plants easy to handle. With larger plants it was certainly not necessary, and was essentially a bad practice, even for the expert and could only hope to succeed in the hands of an expert and was not advice that should be given for general consumption. No gardener would shift a plant while in active growth, remove the soil and replant, except for some vital reason. The fact that it is possible with *Cymbidiums* is due to the large stiff, hardy and relatively few roots instead of innumerable thread-like fibrous roots of the ordinary plant which are so tender to exposure for even the shortest time and so very easily damaged. Moreover, in *Cymbidiums* the damage would not be at once apparent but might appear in months to come as, in the interval, the new leads carry on from bulb reserves.

Dr. Vote, in conclusion, thanked Mr. Cambourn and Mr. Adamson for their criticism, and for their eulogistic remarks on his address in general, and by way of a general reply stated that he found it impracticable and impossible to specifically particularise. That would entail a detailed discussion of each individual plant. His aim had been to provide a general scheme of culture of *Cymbidiums* in which each statement was not empirical, but backed by a reason and with some thought as to the physiology of the plant. The advice he had given had worked out in good practical results in his own collection, and it had helped others who had sought advice. He, therefore, hoped that, as an address, it might be of some value as a fairly comprehensive working plan of culture for those not already expert, for those meeting with no success, and for those who thought that their measure of success might be improved by some experimentation that, in their own wisdom, seemed fairly reasonable and worth a trial.



N. SARCOCHILUS FITZGERALDII, F. v. M.

The clump was planted in a pine box with leaf-mould and elkhorn fibre in 1941, and is now (15/2/1943) flowering for the second time in an open bushhouse where maiden-hair ferns do well. The roots are attached to the box, and there are about twice the number of flower sprays this season as there were at the last flowering.

Plant and photo by Miss K. McIlrath, Murwillumbah, N.S.W.

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"Saying it with Orchids"

J. MURRAY COX, *Brisbane, Q.*

Continued from March, 1943, issue

"Herr Fuhrer," responded Ethelbert, "nothing has ever given me greater pleasure than to hear you speak so. I know that in their heart of hearts the people of the British Commonwealth neither seek world domination nor desire to deprive the German or any nation from a fair and reasonable benefit from the good things of the earth. Our peoples would welcome any lasting arrangement by which all the world could live in peace and charity with one another. Whatever wrongs have been done in the less enlightened and less intelligent days gone by can surely be righted by men of goodwill meeting in conference to discuss these matters. But I am of no account in the councils of the nations. Let us forget the world a little longer and see what other blooms are here to delight you."

They moved on from plant to plant. The circuit of the glass house was nearly completed wher Herr Hitler pointed to a plant which had thrown out a long scape bearing a dozen or more large flowers. These were creamy in colour, beautifully spotted and striped with crimson and purple.

"What is that plant?" asked the Fuhrer.

"That is another cypripedium, or slipper orchid," replied Ethelbert rather proudly. "It is a very rare plant and one of the gems of my collection. It is found in what used to be called Kaiser Wilhelmsland, in the mandated territory of New Guinea. You will notice the strange shape and position of the dorsal sepal—it hangs over the pouch just like an umbrella. It is called *Cypripedium Chamberlainianum* after:"

The Fuhrer stiffened as if he had been stricken suddenly in the trousers by a pellet from a catapult. His face became purplish. His Chaplin moustache vibrated and then stood out like pins in a cushion. He made gurgling noises as if he were choking.

"So"—he screamed, "you have come here to insult me. You bring your verdompt Chamberlain and his treacherous deceiving umbrella here to humiliate me—me Adolph Hitler, the Fuhrer of Germany renaissant, the destined ruler of the world! Lieutenant Von Schlieper-Spittenhausen, call the guard and arrest this—this—cockroach."

"Heil Hitler," replied the Lieutenant with the usual gesture. He blew a shrill blast upon his whistle. The door of the glasshouse was thrown open and a number of storm troopers rushed in.

"Arrest that man," said the Lieutenant. The storm troopers closed in upon Ethelbert, who struggled violently but was soon overpowered, and frogmarched on to the deck.

The Fuhrer and the Lieutenant followed.

"Mr. Ethelbert Smithers," said Herr Hitler, his face with a peculiarly owllike look. "No doubt in your foolish way you thought it clever to come here and insult me and my poor distressed country. No doubt you thought that by appealing to my love of beauty, my art, you would betray me into foregoing my revenge upon your treacherous, effete and perfidious nation; would trick me into ending my plans for the spreading of the healthy and divine doctrine of the German Culture throughout the world until all nations shall be welded into one, the German Reich, and I, Adolph Hitler, artist and Messiah shall be its Lord. But you have failed, and the penalty of all failure is death. You will be placed against the wall of this insulting glasshouse and there be executed by rifle fire. That is my will." He turned to the Lieutenant and continued. "Have this man bound to a chair and placed against this wall of glass and have him shot."

Ethelbert by a sudden movement, wrenched himself free from the grip of his guards. He drew himself up fearlessly.

"Poor Adolph," he said gently. "It is a terrible thing that they did to you, for they killed the artist in you and in its place created a vandal. You might have become a great painter or a poet, for you have in you the things that make the artist. You might have led your people to a high place in the history of mankind, for you have in you the things that make a leader. You have done things which stamp you as a man above men. But alas! those years of suppression in your youth have warped you and instead of leading a regenerated Germany along the path which leads to contentment and partnership with its fellow men, you have chosen the track to the mirage of world domination—and at the end of the track is a crumbled ruin. I do not fear your bullets—the termination of my existence means nothing to the world and little to me.

To be concluded

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By J. MURRAY COX
Sometime President of the Queensland Orchid Society

"The author says: "*The constantly increasing interest in the cultivation of Orchids in Australia and my knowledge of the difficulty most beginners have in obtaining reliable information as to the natural conditions in their native haunts of the plants they endeavour to grow, have persuaded me to commence the very ambitious task of tabulating, as far as is possible, the data available relating to these plants, and to deduce from this data suggested cultural treatment for most of those species generally grown by Orchid lovers. The aim of every grower should be to give his plants as nearly as possible the conditions naturally ideal for their welfare. It must be remembered, however, that it is practically impossible to reproduce natural conditions in their entirety, and therefore each grower must strive to add by artificial means the factors which his available conditions otherwise lack.*

"*I believe the information I give will assist considerably, but I would emphasise that no one can set out an arbitrary code of rules for the culture of any Orchid. The best that can be done is to give a general outline based on the plants' natural requirements, and each grower must then modify this to meet the peculiarities of his own conditions.*"

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Volume 8 **SEPTEMBER, 1943** No. 3

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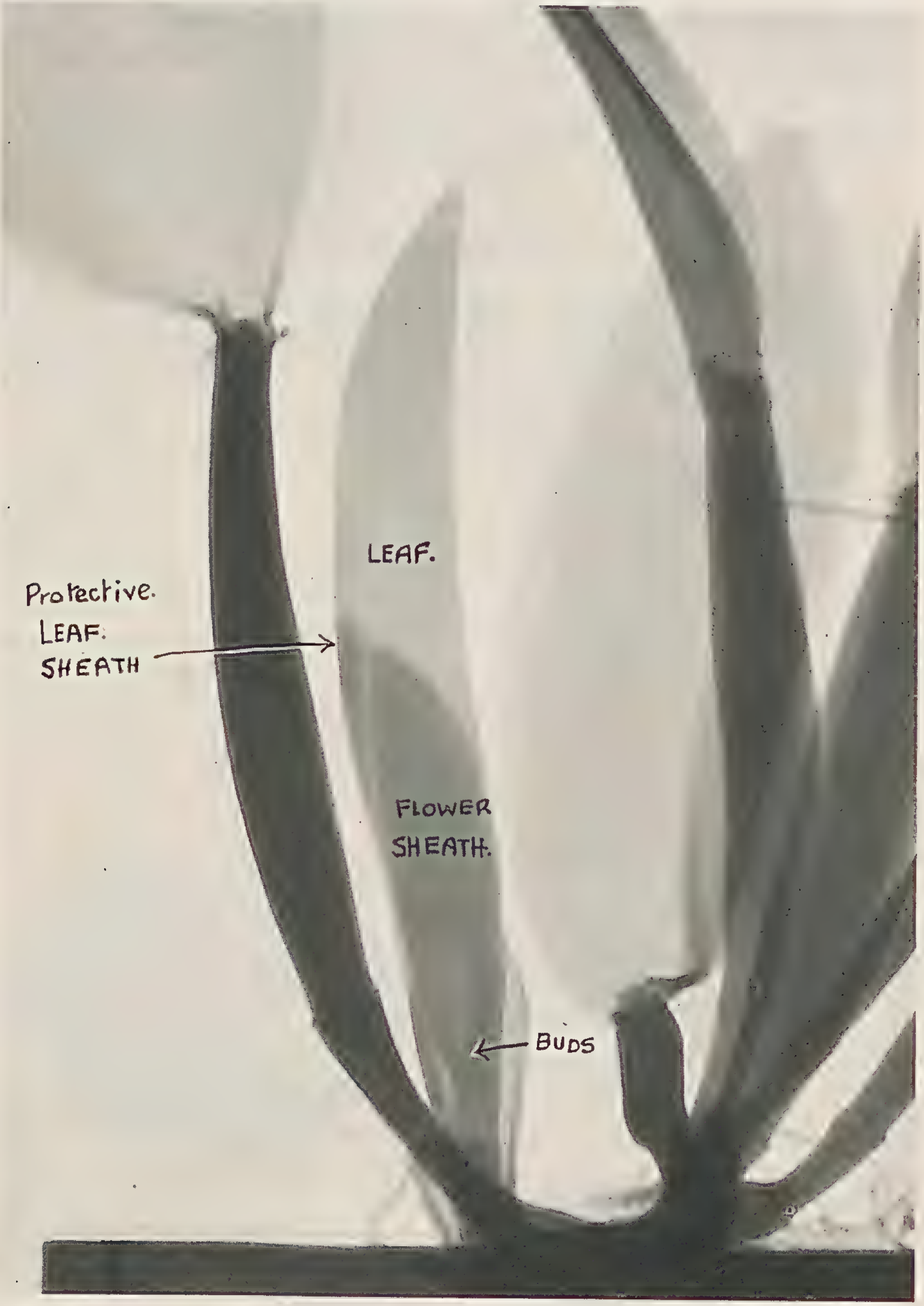


Skiagram No. 1, Blc x Soulange, (19/1/1943)
Grown and photographed by Dr. J. A. Vote.

True Maturation

and its influence on Florescence

Dr. J. A. VOTE, *Cronulla, N.S.W.*

In a recent address, at the January, 1943, Meeting of the Orchid Society of N.S.W. I made reference in a paper on "*Miltonias* and their culture" to "maturation, side by side with new growth." After the paper this was discussed at some length and what was meant was demonstrated in a series of skiagrams of the *Cattleya* genus.

This article is a written elaboration of that theme, requested for publication in the "Australian Orchid Review." If it challenges the truth of an advice that has been handed down, by spoken and written word, for many a year by many a grower, I hope that the reader, no matter what his length of experience may be, will approach the subject with an open mind and come to an unprejudiced opinion. It may be that there is in this idea, something of reasoning and truth even though it steps off the path of empiricism and conservative teaching. Because it does just this it may at least provoke a new stimulus to intelligent enquiry on an old subject, and this in itself is not without its value.

How often have you said or heard it said, "When the new bulb is nearly made up, remove the plant to cooler and more airy conditions, and gradually slacken the water, in order to mature the new lead and induce flowering." I believe this to be quite wrong. Whether the new lead will flower or not depends upon the plant behind it being well grown and matured, and whether the new lead will flower or not is laid down very early in the piece, in fact when it is no more than a swollen vegetative eye. At this stage certain cells are set aside and later undergo specialised development to ultimately become the flower spike and flower. In this early stage the differentiation of these cells from other cells, and their number is small and appreciated only microscopically, but later, while the new lead is still very small, this differentiation of the cell structure and their number has proceeded far enough in development to be macroscopic though hidden within the structure of the plant from the ordinary eye.

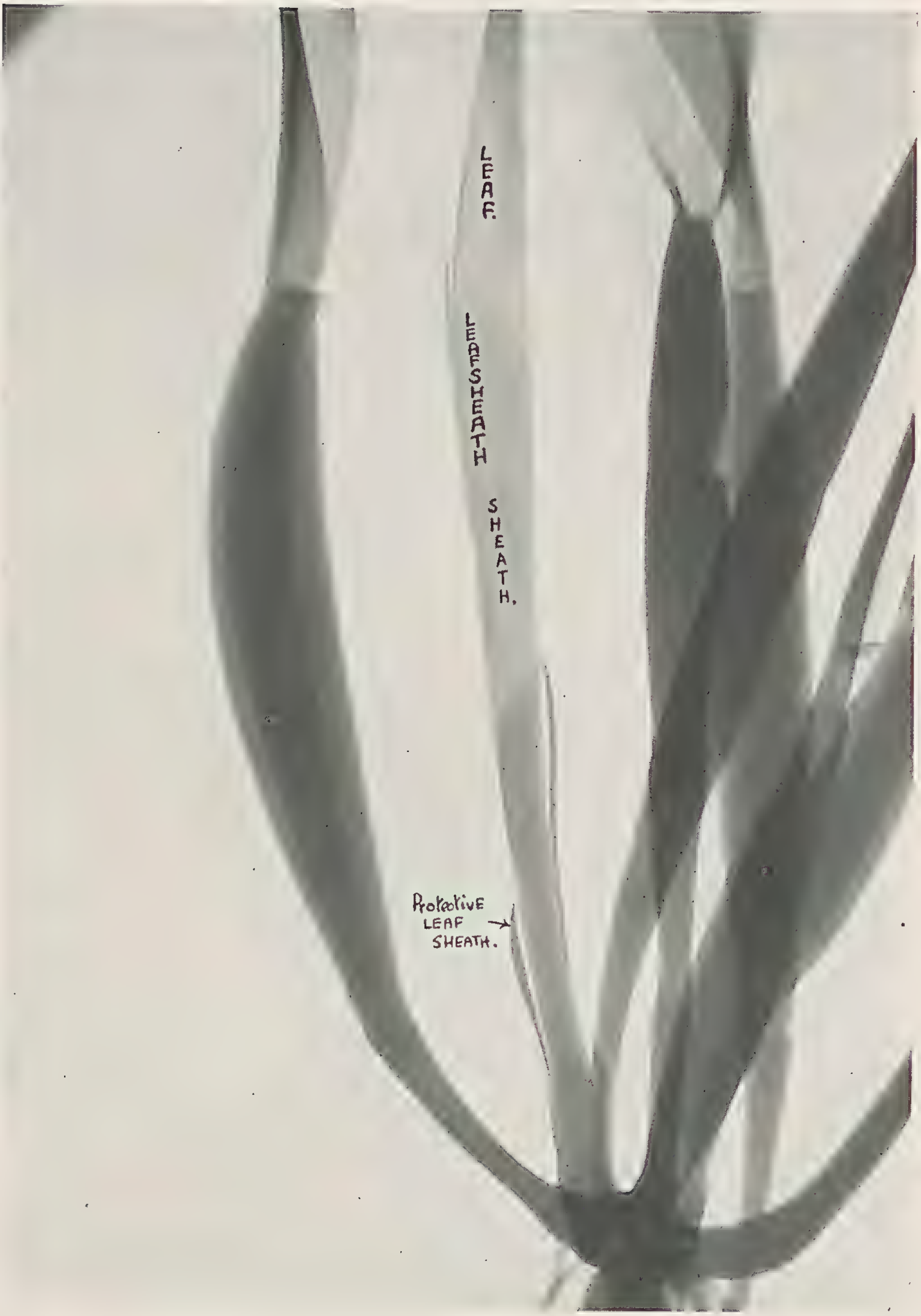
Skiagrams (X-ray pictures) of the young new lead clearly reveal the hidden spike and flowers long before the "new lead is nearly made up" and consequently the advice to "withdraw water and give harder conditions to induce flowering" is utterly wrong since whether it will flower or not is established long before the bulb is nearly made up. In fact to follow that advice is definitely bad culture. The flower is but the preceding stage to the seeding. Seeding is the logical sequence to the flower in nature, and is indeed the plant's conception and pregnancy. By it, it reproduces its species. I do not know, nor do you, any living thing that requires to be starved, in this stage of its existence. If you do starve it, the progeny (in this case the flower and seed) will surely suffer. Now, the following skiagrams will, I hope, adequately prove this even to the most sceptical.

Skiagram No. 1 is of *B.L.C. x Soulange.* It was taken on the 19th January, 1943. It is due to flower in September. It flowered in September 1941, September, 1942.

In the skiagram you will note the leaf just emerging from the leaf sheath that surrounds it, the bulb is about ½ inch high, the flower sheath can be clearly seen, and two rudimentary buds are clearly shown. All this, 8 months before it is due to flower, and while the new lead is anything but "nearly made up." Where, then, can possibly be the necessity to "move to drier and more hardy conditions when the new lead is nearly made up in order to mature it and induce flowering."

No! Feed it. That means water it. The plant is about to meet the greatest strain of its existence. You surely cannot starve it. Grow the whole plant "hardy" so that the bulbs behind the new lead are mature. Grow the new lead hardy, but feed it, and so you get "maturation side by side with new growth." It is the strength matured in last year's and other years' bulbs, that will induce the new lead to flower, for this is determined long before the new lead has roots of its own, and is still dependent on last year's bulb whether it will flower or not, and this is proven by the X-ray picture.

Take a daffodil bulb, grown in the open ground under good conditions. This bulb can be grown in pure water. It will flower. It flowers on the strength matured and stored in the bulb. Grow it in pure water the next year again. It will not flower because no reserves have been stored, i.e.,



Skiagram No. 2, Cattleya, (19/1/1943)
Grown and photographed by Dr. J. A. Vote.

the bulb is not matured, during its growth in pure water.

Skiagram No. 2 is of a *Cattleya* which won first prize in Mr. Carrington Deane's show at Anthony Hordern's Ltd., in September, 1942. That is, it flowers in September. The skiagrams were taken on the 19th January, 1943. There are 2 leads, and in the skiagram both leads show a sheath and this, 8 months before it is due to flower.

All this should prove: (1) That the potential flowering of a new lead is laid down when the new lead is but a swollen eye, and (2) the flowering of a new lead depends upon the maturation, that is the food reserves and vigour of the bulb or bulbs behind the new lead since the flower is evident in the new lead while it has no roots yet of its own, but is being maintained wholly by the bulb behind it. (3) That the above being so, it is useless to follow the accepted idea of waiting until the new lead is nearly fully made up, and then reduce the water and move to drier, cooler, and more airy conditions to induce florescence.

This is proven, I hope, to your satisfaction by these skiagrams of the *Cattleya* family. Now it is a basic physiological truth, and applies to all your Orchids, *Cymbidiums,* as well as *Cattleyas.* The plant is preparing for seeding, the flower is an essential and first stage of seeding, i.e., it is its first stage of a pregnancy by which it will reproduce its species. Do not starve it. If you do it may abort. That is, the embryo flower will stay embryo and never develop, and you will say, "My *Cymbidium* did not flower this year." It did—but you never saw the flower because it was embryonic and did not develop. The flowering eye was there. Next year, you may treat it more reasonably, so that its vigour is greater, and the bulbs more matured, and so you may get a flower spike from last year's bulb as well as the new bulb, in the case of *Cymbidiums.*

If a plant is adult in size and age, if it has been grown well and not only well as far as size alone is concerned, but grown hardily so that it is matured, by judicious exposure to sun and air for the previous two years, there is no reason why it should not flower—if in its critical stage you do not induce miscarriage of the flower by injudicious treatment that will result in starvation. The critical stage is the early growth period. For instance in the case of the *Cattleya* —it flowered in September, 1942, began to grow a new lead late in October, 1942, and in January, 1943, the X-rays demonstrated a sheath and two buds. There were no new roots to the lead at this time. So that nothing must be done to the plant that will produce starvation from the time of the new growth until the flower spike or flower sheath appears, e.g., failure to water it or injudicious potting to damage roots, etc.

In conclusion there are two things I would like to mention. I had thirty-one *Cymbidiums* of adult size, and which I had grown for 2 years, some had never flowered before, others had. Following the above line of argument, with other factors of culture twenty-nine flowered, and the two which did not flower were *grandiflorum* and an unflowered seedling, which latter, incidentally, is showing a spike this year already.

The second is this—last year I had a few back bulbs which made up their new bulbs, and these new bulbs flowered. Many of you will remember me taking four of these into a monthly meeting of the Orchid Society of N.S.W., and there cutting the small spike and showing the buds. All these were from back bulbs, well grown, of recent growth, and which had themselves not flowered. The relatively small new bulbs flowered, largely from the maturity of the old bulb. At least, they gave the new lead the embryo flower, and carried it far on its way, the final stages and the maintenance of the flower resting on the efforts of the small new bulb, when it had developed its own root system, and could supply its quota of nutriment.

There are other factors governing florescence, but this question of maturation is perhaps the greatest. The others deal with culture of the plant to produce adequate adult growth, and involve composts, potting, situation, etc., but these are for another time, perhaps.

Gunner Ron Stewart writes to express his appreciation of the hospitality accorded him by Queensland Orchidists while he was passing through Brisbane. He specially mentions Mr. L. C. Home and family, and Mr. T. C. Harveyson and family, all of whom made every effort to make his sojourn in Brisbane comfortable and interesting. Ron says "I have heard quite a lot about the hospitality of Queenslanders, and Mrs. Home and Mrs. Harveyson made me feel quite certain that it was no myth."

● Subscriptions for the Australian Orchid Review, 6/- (six shillings), should be posted to Australian Orchid Review, c/o Messrs. Shepherd and Newman Pty. Ltd., Yurong Street, Sydney, N.S.W.

Miltonias

Dr. J. A. VOTE, *Cronulla, N.S.W.*

● Not I, nor anyone else on God's earth can tell you how to grow *Miltonias*, or any other genus, and guarantee you success, by giving you a catalogue of instructions. They could never be complete enough and never more than instructions. It is the *reason* of the instruction, the "why" of it, that really counts, and this involves a knowledge of the physical phenomena of light, heat, humidity, watering and ventilation; how to obtain them and, more important still, how to use them, in relation to the plant's variable stages of its life cycle. These and the life cycle are the essence of Orchid culture. If you know and understand these you can grow not only *Miltonias*, but any Orchid.

At once, let me be emphatic that the method of culture advocated is only one man's idea of culture, and I do not claim that this way is the only way to find salvation in the culture of *Miltonias*. That this method has brought me, and the friends who have adopted it, some measure of success has been proven to you by plants and blooms that have been exhibited from time to time at these meetings. So, then, it is practical and not theoretical, and, if faithfully followed, should bring some measure of success to those of you who have admired the blooms of this genus, but cursed its vagaries and passed on to those species requiring, perhaps, a little less understanding of the crux of Orchid culture for their successful growth.

One word! If you have a *Miltonia* flourishing like the biblical greenbay tree—and not only flourishing but flowering — shun this, or any other advice as you would the works of the devil. You know how to grow it. Leave well alone. Better still, tell us all.

You have just bought a *Miltonia*, cheap, because its condition is rather poor. The dealer has a worry off his shoulders, your money in his pocket, and he is happy. You have a problem and some mental reservations as to the wisdom of your part in the whole transaction, and you are perhaps not quite so happy. Yet you need not fear. For let me at once say you have the best of the deal. Four *Miltonias* bought at 6/3 each from Mr. John Bissett two and a half years ago, in deplorable condition and now doing well and flowering consistently prove it. *Miltonias* can be first, successfully, and second, easily grown in Sydney, with only a little more care than *Cymbidiums*. After the war they will be grown in their hundreds.

The First Step: Examination to Determine its Stage in the Growth Cycle.—The plant you have bought is, let us say, in its period of rest—that is the front bulb has been fully made up for some time and has its root system, and there is not the faintest sign of a new lead deep in the axils of the old leaves. At this stage the roots and the plant are dormant. Be sure of it, because your first step in its culture depends upon this. Critically examine the plant. View it at night in front of an electric light bulb, a miniature X-ray, and you will thus see the very earliest sign of any new lead, casting a shadow through the old leaves folded at their base round the bulb. If a new lead has just started, the old roots will no longer be dormant, but will have root eyes and even lateral branching roots and, unless the compost is hopelessly sour, you must not risk repotting it. In this case wait until the second chance of repotting comes, namely, when that new lead just begins to show tiny short roots, or better still, the root buds.

Treatment of Newly Bought Plant in Dormant Stage.—But this plant, after examination, is dormant. Good. In fact, very good, because now you can start to grow it your way immediately. Soak the pot in water for five minutes. Then push a stick through the drainage hole and force the plant out of the pot. Separate all the compost from the roots by hosing it, or shaking it under water. Cut off all the bulbs leaving only the front three. If it has any more than three it will be a miracle anyway. Lay the back bulbs aside for future treatment. We will come back to them. Cut off any broken roots from the front two bulbs at the site of the fracture, and all roots on the bulb or bulbs behind the front two. Cut away all dead, or nearly dead, leaves, and the dead bases of the leaves which have naturally dropped, except the last pair that fold against the bulb. Pull the tops of these slightly from the bulb and leave them. All this dead and dying foliage is probably scale and thrips infested. Anway, you dare not take the chance. Immerse the plant in 1 in 20 pestoxol solution, or some other approved insecticide solution of known safe strength, for five minutes.

Compost.—While it is soaking go, get ready the compost.

The compost does not matter nearly to the extent of popular belief—the only things that matter about the compost are these:—(1) It should be clean and fresh and, of course, suitable for plant life. (2) Its physical texture should be suited, and the materials selected according to the conditions under which you aim to grow the plant. The physical properties of the compost are as important as its food value, for they determine how you will water and where you will grow it. If under cool glass it must be light, spongy, and aerated but tight, e.g. 3 parts washed, clean fibre, one part sieved tan bark, ½ part *coarse* sand, ½ part good leaf mould (not dirt). If in the bush house, the compost can afford to be heavier, because evaporation will be greater and quicker, and your whole aim during growth, and if need be, maturation and florescence, or in fact as long as the root tips are green, is to keep the plant moist continually, but never continuously wet. So in the bush house, let us have—One part fibre, 2 parts tan bark, 1 part coarse sand, and ½ part *leaf* mould.

Potting.—The compost is mixed—it is dry, keep it dry, and we go back to our plant. Lift it out of the solution, take a soft tooth brush, dipped in the insecticide solution and *gently* scrub both surfaces of the leaves and all the parts of the bulbs we can conveniently get at.

Select a pot that will allow for the growth of two extra bulbs, wash and clean it. Enlarge the hole to almost the whole size of the bottom of the pot if the plant is to be grown under glass and only double the size of the original hole if to be grown in the bush-house. Evaporation, remember, and drainage. Evaporation being greater in the bush-house, the drainage hole is smaller, but drainage still quite good. Cover the hole with a curved crock, concavity downwards, add large crocks, always concave side downwards, add finer crocks, any old way, and cover the whole crocking with a half inch layer of pure fibre. The crocking and fibre should fill half the depth of the pot.

Take the wet plant and holding it just below the level of the rim of the pot with the last back bulb against the edge, arrange the roots and fill in the dry compost made ready and fully mixed. Pot it firmly by hand without dragging on the roots to fracture them at the base of the bulb. The base of the plant should be on or *barely* beneath the compost. Now take a potting tool and lever the compost inwards and add fresh compost at the side of the pot in the front part first and then all round the sides. When finished the back bulb should be just away from the rim of the pot, the base just on or just barely under the compost, there should be room for two new bulbs and the compost should be tight. If the base of the plant is just on the compost, place a little finer tan bark around the leading bulb to guard the expected new root-eyes from the depredations of the prowling slater or slug—if just below, leave it alone.

Cultural Treatment.—Place the plant, dry, where it is to grow. The insecticide will have dried on the leaves and bulbs and with the humidity it will be unnoticeably moist yet a deterrent for some days for any new eggs that may be hatched. If grown under glass, soak in water on the fourth day and on the second day if grown in the bush-house. By this time root fractures will have calloused over and little or no harm or at least less harm, will come to the roots than would have been the case if you had begun with wet compost and kept it wet. Soak for at least 10 minutes so that the compost is thoroughly wetted. From now on water the plant and let it dry out for a day, then water again. In the fullness of time and by the grace of God, Orchids being what they are, a new lead will appear deep in the old axil, on one side of the leading bulb. If you are lucky, two leads, and if you are keen as well as lucky, you will first notice them by seeing their very beginning one night by holding it against your electric light. When next you see your dealer you'll casually mention how well the plant is doing, hoping to justify the folly of your purchase. As soon as you see the new leads, visible evidence of new growth, you will know new roots have already started from the old dormant ones, and the plant is asking for food. A plant can only take food in solution and water is the solvent. That is the only reason of watering. So water and water to keep the plant moist, not wet. If the drainage is good and the texture of the compost suited to the situation of the plant, water as much as you will, the excess water will run away in an hour, but the compost will stay moist for hours or even days, depending on the weather. To attain this optimum condition of moistness it is obvious that more frequent watering will be required if grown in the bush-house. It was for this reason we made the compost heavier and the drainage hole, smaller, to minimise the danger of too complete and too sudden evaporation. The whole time of growth that is, until the bulb is fully made and the last leaf, adult in type, water frequently enough to keep the plant moist.

Maturation and Florescence.—Finally besides the branching from the old roots, new roots will have grown from the new lead, or they may be delayed till the bulb is fully made up, or appear even while it is in flower and, in the end, you have a matured plant. So do not worry about maturation. I have no time in this address to discuss this, as I have explained before. Suffice it is to say, that maturation proceeds side by side with growth, that whether a bulb will develop a flowering eye or be sterile as far as florescence is concerned, is laid down very early in the new growth, just as sex and potential fertility is determined in the early days of the unborn child; that by the time the bulb is making up whether the bulb will flower or not has already long since been decided and, that florescence and the logical expectation of seeding is the plant's pregnancy and I can see no reasonable argument to starve it, or, in other words, since food can only be used by the plant in dissolved form, to cease to water it. If the bulb is big enough, or adult enough, having overcome its previous hard treatment, it will throw a spike and the flower will delight your eye. It will last longer than your *Cattleya,* as long as your *Cymbidium,* nearly as long as your *Cypripedium.* The plant is young, florescence is its attempt at maternity by seeding. Cut the spike early on the first flowering, lest the strain be too great. Let the plant rest from its labours.

Rest.—The bulb is made up and matured, the leaves adult, it may or may not have flowered, all the roots become dormant again, sealed at their tips, mute direction that they need less water. If you water them as heretofore they may rot. So slacken the water. Let the plant dry for a day, then days, then a week, but watch it. If it looks dry, loses its lustre of leaf, water it. Keep it plump. Better than watering it, move it to where the humidity is higher. This is equivalent to watering, but the action is continuous and very slow. In the fullness of time, the growth cycle commences again. As soon as you observe the first sign of the new lead, gradually commence the watering and thus the feeding. Gradually, because the new lead is a tender life, and the roots are new and also tender, and *no* young thing can withstand sudden changes. Lead the plant gently once again through the cycle of new growth, maturation side by side with growth, florescence and finally rest. If after two such cycles it should be necessary to repot, do not do it immediately after flowering when the plant's stamina is at its lowest ebb, but just before the new growth appears. Remember flowering is the plant's first stages of its attempt at maternity, the first stage of the seed, and consequently it is weak. Be kind and wait until it has regathered its strength. But if the new lead begins while the plant is flowering, do not hesitate to repot it in flower, but cut the spike early.

Vegetative Propagation.—But we have forgotten the back bulb, which we cut off. We placed it in the cool glass-house half buried in growing moss or in a layer of half fibre and half tan bark, and kept it damp but ventilated. In the end we saw a fine, weak shoot. We lifted the bulbs to the level of the moss and watched it more carefully. One day we saw at the base of the old bulb or the base of the new shoot, a green excrescence that looked suspiciously like a root eye. In 3 days we were sure, and on the next night we potted it as we did the original plant, only this time, we watered the compost and pot immediately, grew it under shelter, and treated it exactly the same as we did the original plant. It made a small bulb—we placed it with the original plant, since we could now treat them both alike.

One fine day, a chance word, not *too* chancy, brings the subject of *Miltonias* into discussion with our dealer. He inquires with a smile about your one-time purchase. You tell him with a bigger smile all about it. But lest he thinks it was all too easy we gave him these warnings, and for emphasis we will number them.

(1) *Miltonias* are the most susceptible plants to disease within my experience.

They must be constantly sprayed and if you have no spray, no insecticide, and no time, don't grow *Miltonias.*

Spray each three weeks to kill the inevitable pest, and stop its breeding. Your house must be clean.

(2) Grow in the same diffused light as you would grow—and do grow—your *Cypripediums* which, incidentally are also susceptible to disease but not nearly to the same extent as *Miltonias.* If your "Slippers" are dirty you can't grow *Miltonias,* and don't try.

(3) Ventilation must be adequate, and do not obtain the moist conditions of the compost in the growing period at the expense of ventilation.

(4) In the winter move in under shelter, if grown outside glass. The best treatment at all times is a cool, well-ventilated glass-house. In summer almost bush-house ventilation, but certainly a cool glass-house in winter, with clear glass, clear for adequate light, and glass for protection and a modicum of warmth.

Treatment of Plant in Active Growth.—Now this disposes of the question of *Miltonias,* except that the plant we bought may have been debilitated, dirty, ravaged by disease, but, with the tenacity of all things living, trying to maintain life and so throwing a spindly new lead. Thus it is different to our previous plant in the dormant stage. What must we do with it? Since the new lead has started any roots that may be present have passed their dormant stage and if we could see them they would be showing new roots or root buds from the sides of the dormant ones. The plant, as bought, is already weak. If we repot it at this stage we may shove it over the precipice to its death. Because of the inevitable check to its continuous growth by interference with the new roots, we would force the plant to live temporarily on its own fat, namely the reserves in the small weak back bulbs. We must dodge this. So do this—examine the compost and potting. *If the compost is reasonable* in physical texture, age and cleanliness, and the drainage good, clean the plant, cut away the dead and the dying foliage, dip and spray it and continue to spray it. Forget about flowers, treat it gently under gentler conditions and concentrate on vegetative growth. When the new lead is fully made up into a small bulb, rest it and, just before the new lead starts, repot it then, as described earlier in this address.

If the compost is hopeless, the drainage bad, or your curiosity too great, knock it out and examine it. If there are some roots from the last made bulb alive and growing, repot, and suffer the check to the plant. Keep it dry until the inevitable damage to the root system occasioned by the repotting is somewhat overcome by callousing of the root fractures and then treat as an established plant, but more carefully.

If all the roots are rotten, cut them away, clean and trim the plant, dip and spray and place it in a bed of growing moss or fibre and tan bark. Keep it damp. Continue to spray and treat as you treated the back bulbs. In fact, having no live roots, that is all it is, a shot back bulb. As soon as any root buds show—repot. Keep moist and sheltered at first until the root system is well away and then treat as I have already described under "Vegetative Propagation" from back bulbs.

Summary.—Now a last word! Perhaps the greatest thing, given *reasonable* cultural conditions, in growing *Miltonias,* is cleanliness above all, first and foremost. The second is good drainage, since it is shallow rooting and the roots are fine and long and so liable to rot. The third is suitable compost, kept continuously damp, but not continuously wet during the whole growing period, and the fourth is subdued light, suitable to *Cypripediums,* but not dense shade, and the fifth is reasonable shelter in the winter.

We have dealt now with the treatment of a dormant plant, a plant with a lead growing in (a) reasonable compost, and (b) bad compost, and vegetative propagation by backbulbs. I have spoken a little about maturation and florescence and the growth cycle, composts and potting, watering, situation, and have given a few warnings, especially about pest infestation. But it still must go into your house, not mine. You must grow it and watch it, not I. I know the humidity and ventilation, light and heat of my house, and I don't know yours. And I don't know how much you understand of the importance and use of the physical factors of light, heat, humidity, and ventilation, or of your observance of a plant's physiological cycle. So you may follow all these instructions and yet fail. True success can only come from the intelligent use of the fundamentals of light, heat, humidity and ventilation and their variable use according to the plant's growth cycle. So that writes *finis* to the subject of *Miltonias*—at least as far as my experience goes, and as far as I can help you.

Continued from page 47

to know about these things, and it is returned "*P. nutans,* a variety," and you are disappointed. It does not conform strictly to the published description. No; Nature seems to chuckle at making published descriptions look foolish. She adds something here, omits something there, dwarfs the flower or makes a giant of it; and there you are.

But no great harm is done, provided you realise that the best of descriptions can only be approximate, and that they cannot include every variation which has been or may be observed. And remember, too, that when a species is said to be "variable," that does not imply that there are other species which never swerve from rigid adherence to the description of what we call the type. No such species exists; Nature won't tolerate it. It only means that the species in question exhibits an even greater and more obvious inclination to be variable than is usual. How, then, can we tell the borderline between species and variety? Ah! there you are asking something which needs, we may say, a whole chapter to itself—and I have been too long-winded already.

A North Coast Jaunt

W. WORTH, *Willoughby, N.S.W.*

● I wish to tell of my recent trip, and incidentally, of men and Orchids of our North Coast. I took a return rail ticket to Grafton, and, about Kempsey, it began to rain. It rained heavily during the four days I stayed in Grafton, this proved a bit of a nuisance, but we little knew, then, that it was the breaking of the drought in Sydney.

However, I had gone prepared with the names of Orchid lovers who subscribe to our journal, the A.O.R., and in spite of the weather proceeded to find them. There are a number of people in Grafton who have grown Orchids and to a certain extent still have them, mainly native Orchids.

Grafton grows good double *Gerberas*, and its "Avenue" of giant *Jacaranda* trees is deservedly famous. The delicate violet coloured flowers above, and the carpet of fallen blooms beneath make a wonderful setting that can not be adequately portrayed. Their all-over faint perfume also is delightful. The hotel was prettily situated on the river facing the Town Hall and two immense *Elm* trees.

Leaving Grafton by service car the next point of call was Lismore. Lismore is a grand town with wide streets and the substantial buildings face a block of four streets. It also has a splendid daily newspaper. There is no Orchid Circle in Lismore. I mention that because it was generally supposed here, in Sydney, that there was one.

The vestibule of the hotel was decorated with an immense bowl of the finest Gladioli that I have seen, and very soon I was in touch with the grower, who kindly asked me to a meal and took me in his car some 30 miles to the Coraki district to see a friend's Gladiolus farm and collection of Orchids. The grower has some photographs of native plants and animals; he is a busy man, keen on Orchids and would like to know more about them. Here we were told of a fine *Dendrobium nobile*. "Don't miss it on your way back," they said. The plant was growing among trees in the garden in what may have been an oil drum or garbage tin. The material used was nothing else than chip rubbish from the wood heap. The plant was fat and robust and tall like a small shrub. We see nothing like it in Sydney, and the plants imported from India or Burma as large specimens do not compare with it. I was told of a whole drive-way from road to house somewhere Bangalow way, of similar specimens. The flowers were large, but perhaps not better than our best. One stem had about a dozen or more large fat aerial growths, and undoubtedly the giant growth of the plant was due to the great annual rainfall and warmth of the North, and not to the unusual potting material.

At another home near the town, *Dendrobium nobile, D. thyrsiflorum,* and *D. infundibulum* were doing extremely well, although the grower knew little of Orchids or the usual cultural methods.

Other growers in the district were endeavouring to grow a diversity of plants in heavy or total shade, and consequently the plants are very weedy and must eventually pass out.

There are quite a number of homes in Lismore which have a few plants. Eucharist lilies do very well in the Lismore district.

The next call was at Brunswick Heads. The car-trip through the fertile country was delightful. Here, through lack of staff, some difficulty was experienced with accommodation at the hotel, although the hotel building is a fine structure. Brunswick Heads is a lovely place, clean sand, clear water, plenty of grass and shade, and real fishing.

I contacted the local Head Master, Mr. Fordham, who has a fine reputation both as a man, and for his knowledge of native and exotic Orchids. He has interested his pupils, too, in nature study, and they grow a number of terrestial Orchids in the school grounds.

I spent several very happy hours with him and his family. At the week-end he conducted me to where *Phaius* grows. Years ago there had been thousands of them, but we were fortunate to find any—about 6 plants in bud not quite open. They grow on the edge of the swamps in marshy ground amongst grass and undergrowth, but not actually in the water. If you dig one out with a spade, the hole quickly fills with water. This should indicate to us the way to grow *Phaius*. Here, I was introduced to the local member of Parliament who was visiting the district, also a great lover of nature, particularly trees.

There are no service cars from Brunswick Heads over the week-end but I was fortunate in getting a car that runs, when required, to convey people to the Picture Theatre at Mullumbimby. As a town I thought Mullumbimby was very drab, and uninviting, but here I enjoyed the stay immensely, thanks to Mr. Roy Norris, the Banana Industry Inspector, and holder of many other interests in the town.

One evening he said, "How would you like a trip to the gorges; I haven't been there for a long while, and could do with a day out, if you care to come." So it was arranged for him to call at the hotel for me next morning, and we set off in the car up the river, crossing many concreted fords on the way. The scenery is truly rural and beautiful. Willows and native trees line the river compelling one to wish to linger amongst the beauty. This district appealed to me very much. The car took us as far up on to a ridge as it was possible to go, and then we commenced our climb.

Sometimes walking upright, but mostly scrambling over things or on hands and knees in the hot sun (and that Monday was a hot one) until I had to cry "enough." However, after a rest we moved on, and finally discovered a way down into the ravine that we had set out for. Here it was cool, and a delightful little stream tumbled over the rocky bottom, providing a much appreciated refresher.

We soon discovered an area in which the *Sarcochilus Fitzgeraldii* grows, and here, amongst the lovely surroundings we ate our lunch which had been provided for us. The plants were robust, and almost without exception, in flower. White and purple red blotches. They are quite different (finer and more beautiful) growing in their primitive state to a single plant growing in a pot. Apart from their beauty of flower and setting, their manner of growth was very interesting and quite a surprise to me who visualised them growing in an upright position as most plants grow in pots.

On both sides of the ravine were almost perpendicular walls of slightly damp basalt or other metal rock that was almost bare of any leaf mould or soil. The S. *Fitzgeraldii* attached itself to these walls with the roots fully exposed except for some very light moss. Others were attached to the trunk of a live tree that had fallen across the ravine some years previously, all were growing at right angles to their host, and the sprays of flowers too, were extended horizontally in a most attractive manner. From this enchanting spot we moved further on and upwards, and entered about two acres of *Sarcochilus Ceciliae,* not growing on rock faces, but on boulders about 3 feet square. Quite a small plant and not in flower, but I am told it flowers at various times throughout the year. Some of those I brought away with me are already showing their flower spikes. Other species that I recollect in the ravine were *Sarcochilus olivaceus*, the *Cleisostoma Becklerii* "Tangle Orchid"; *Dendrobium gracilicaule, Dendrobium speciosum,* and *Calanthe veratrifolia,* of which there were fine specimens, in addition to Elks, Staghorns and Birds-nest ferns. *Dendrobium tetragonum* is known throughout the North as "Bow-types."

We scrambled out of this lovely spot through lawyer vines, prickly plants and lantanas into the scorching sun again and inspected a large banana plantation high on the hills. This, although strenuous and fatiguing, was a most enjoyable and memorable day, and one that because of the distance and the physical exertion necessary, few of our members are likely to experience.

From "Mullum," as it is called locally, I came right back to Kempsey.

I spent another enjoyable time with one of our Country members, Mr. A. D. Saul, of Frederickton, on the Macleay River, a few miles outside Kempsey. Here in a heated glass house is a varied assortment of Orchids, a number of which we do not often see in Sydney, such as the Brazilian *Cattleya* species, *Oncidiums, Dendrobium Johannis,* and uncommon *"Slippers."* Mr. Saul also has numerous *Gerberas*, including some very fine double ones, samples of which I brought back with me.

From what I saw during my jaunt, I conclude that the two mistakes being made are, first, plants are placed in total shade and become scale infected and weedy, and second, native plants growing on portion of a stick or limb are expected to grow on from year to year, whereas the bark peels, or strips, and the wood decays and the plant hangs in mid-air with nothing firm on which to cling. The same applies to plants potted up with the material worn out. There are scores of small growers throughout the country of whom we in Sydney never hear.

The North Coasters are a friendly and hospitable people.

I arrived back in Willoughby to find my own plants, due to the copious rain that had fallen, noticeably better than when I left. A fitting and satisfactory climax to an interesting and enjoyable holiday.

● Membership subscriptions to The Orchid Society of New South Wales for 1943-1944 are now due and payable to the Honorary Treasurer, Mr. G. J. C. Tosi, 39 Martin Place, Sydney.

The Light Side of Growing Orchids

"Still a Mug".

● Growing Orchids and keeping the peace go hand in hand if you are lucky. After visiting a few collections one realises some of the other fellows' problems. Strange to say in isolated homes one finds the "Boss" (the wife) disinterested in Orchids. One party told me his wife hadn't spoken to him for two weeks on account of chopping a few branches off a special mango tree to let the sun in on a few of his pets. Another hard-doer was pleased because his wife had rooted out the "Maiden Hair" from under his benches, and planted lettuce with most unsatisfactory results.

A member of the Q.O. Society was relating an experience he had when the first "Jap." scare was about. To me, but not to him it was amusing. It appears he had directions from his wife to dig a shelter, but he put her off for a week with the excuse, "nowhere to dig!" By the way he has nearly all his ground taken up with a glass-house and a bush-house. The argument terminated when our friend decided the only place was in his beautiful bush-house. He started on Saturday afternoon, and intended to finish by Saturday night under electric light, while his wife was at the pictures. Immediately after tea he noticed a peculiar smell, but carried on with the good work. The deeper he dug, the worse it got, until it became unbearable. He did not tell me what he had struck, but I told him he should have left it open to boost his Orchids. The smell was so strong that both neighbours were out investigating in their yards, but our friend shrewdly switched the lights off, and sneaked out the front gate. He hung about (outside) until the wife returned from the pictures, then invited her to inspect his handiwork. He would not like me to repeat what she said, but his instructions were short and to the point. His neighbours claim they saw our friend (who is a Warden) filling in, at dead of night, with a Gas Mask on.

This reminds me of what happened when the wives of two Orchid fanciers were discussing their "hubbies." One claimed that her husband spent nearly all his time at home in the glass-house, and she always had to call him to come to bed. The other remarked, "you are lucky, mine married the darn things, as I don't even hear him come to bed."

I read an article on how proud some growers feel when they exhibit their blooms at the monthly meetings of their Society. I wonder if any other grower experienced what I had to put up with at one of my early meetings. Being a beginner and seeing a certain, what I thought, beautiful plant in flower, I purchased and exhibited it a few days later at the monthly meeting. Like a peacock I strutted past the plant a few times listening to what the other fellow had to say. The first remark was from one about scale convinced me there was something wrong with it. Then another: "This grower believes in growing moss inside, outside, and all over the pot," and then a third, "If this plant was staked and tied up decently it would be quite presentable." After this "the peacock" just couldn't take it, and strutted off. Perhaps it is just as well the growers do not exhibit their names on the plants. Earlier I had proudly written my name in the grower's book, but I'll bet the Secretary couldn't read it after these friendly and instructive remarks were passed.

After growing *Cattleyas* for about two years, I was jokingly asked to give my experiences at a meeting. This amused me as I'm convinced that a little knowledge is dangerous, and only years of experience make you proficient in the hobby. My advice to anybody giving a lecture is not to make it too lengthy and stick to Orchids.

You will remember a movie show given by a prominent citizen a few months back at one of our meetings. To most of us, it was more than interesting, but when the operator switched off flowers, etc., on to travel, a certain individual sitting near me went to sleep. My wife was sitting about ten feet from me, and when this chap started to snore she immediately became uneasy, knowing well my efforts in that direction, also that it is a habit of mine at picture shows. This chap is a friend of mine, WHEN SOBER, and on this occasion I knew he had met a few friends before the meeting. I let him slumber on until near the end of what I and others thought was the last picture, but bad luck, another short was shown and all I got for my trouble was "What the H— did you wake me for?"

When people pay £1000 for an Orchid I believe they deserve the name quite a few of my friends call me, now that I have taken up the hobby. Have any of you ever been called a PANSY?

A question often asked is what is your collection worth. The reply reminds me of what they call all fishermen, that reply being quite different to what you tell the wife it cost. It was a shrewd move when Joe West substituted his sign "Orchids for Sale" with "Come in and see me some time." MAE be he is related.

Mr. Murray Cox's warning to make sure of crushing locusts instead of cutting them in two is good advice. His experience of finding the head portion eating one of his *Cymbidiums* after dissecting the locust bears out an experience I had, but was not game to mention, as I have a reputation to uphold.

It is common knowledge that a grower of Orchids does not require a letter of introduction when travelling. Any grower in any country will make him welcome. One wonders if we will be welcome when the day comes. Some of us have been compared with the fisherman, but the owners of hot-houses have an advantage on the "scaly" man. Reminds me of the chap whose wife Anna was always nagging at him to buy some decent Orchids, so he purchased "Hardyana" to shut her up.

They say beginners in Orchid culture are keener, and get a greater "kick" than at any other stage. Reminds us of our courting days.

One writer refers to manuring Orchids as a stimulant, and compares manure for Orchids with spirits for adults. Another little drop won't do us any harm, but if soaked well you know the result.

Most of you have read of *Dendrobium Phalaenopsis* growing in a bullock's skull. A friend of mine was telling me of an experience he had when visiting a grower (now deceased). He noticed a robust *Cattleya* growing in a bullock's skull. On closer inspection he noted the name *Cattleya ditto.* When he asked what the *ditto* meant he was told "SALLY" was the name. It appears this person had a prize cow called "Sally," and when she died he purchased *Cattleya "Sally"* to perpetuate her memory. I was once called a queer cow, perhaps the above throws some light on the reason.

A grower once wrote an article claiming that every Orchid grower was a gambler. To substantiate his claims here are a few notes taken from the English Orchid Review, Oct. 1937. The following Orchids were sold at Cheapside Auction Rooms between 1901-1919, and raised the figures shown:

Odontoglossum Crispum var. Pittianum, 1150 guineas.

Odontoglossum Crispum var. Grairianum, 900 guineas (sold a few years later for 3½ guineas).

Odontoglossum Crispum var Roger Sander, 875 guineas.

Odontoglossum Crispum var. F. K. Sander, 800 guineas.

Thank goodness *Odontoglossums* don't flourish in Brisbane, they must bear sovereigns.

No wonder people (who read) gape when you mention 200 plants in your modest collection. I doubt if it is an houour to be termed a gambler, but aren't we all, even in a small way. I know a "hussie" who kept her "old man" from the pictures for two weeks because her *Dendrobium Phalaenopsis* died after one season. He reckoned marriage was a greater gamble.

A soldier grower of a small collection who has been overseas and to other parts since his return was relating his experiences. His sister cared for the plants, just watered as instructed, and he claims, bar scale, they are looking better now than when he left. He amused by stating that he was always being reminded of his Orchids by the "Mossies." Does anybody know whether "Mossies" abound where *Mossiae* is found.

One reads in the *Australian Orchid Review*, July/September, 1936, under "How to Hybridise": "For best results the seed should be sown as soon as possible after the ripening of the pod. Sometimes the pollen will not take. One reason for this is that the flower selected to become the seed bearer is not in a receptive condition at the time the pollen has been applied. A method said to be used by an enthusiast, and one who it is reported has remarkable success with his crosses is designed to overcome this difficulty. Immediately before and during the act of placing the pollen on the flower he makes a buzzing sound close to the flower in imitation of a wasp or bee. He claims that this has the effect of making the flowers receptive, the same as it would be in Nature when just about to be fertilised by some winged insect." As my neighbours are already dubious about me (I grow Orchids), and as their eyes and ears are remarkable, I'd hate them to catch me acting in this manner. Instructions we should heed:—

1. Do not water a plant when it is dormant.

2. Dormant plants whose bulbs wrinkle are more frequently plants with rotten roots than thirsty plants. To water them under these circumstances would be ruinous. You must not try to start growth by watering.

3. Growth must precede watering, and not *vice versa.* Before beginning to water, you must wait until the plants come out of their lethargy.

4. You will be able to tell when the plants

Cymbidium Disease—A Cure

A. E. CHILD, *Kalorama, Vic.*

● In October, 1942, I purchased a potted back cut of *Cymbidium giganteum* with two growths, the first growth had lost all of its leaves which should have been green and healthy, the second growth was smaller than the first with only four leaves, the four leaves dying back from the tips with a slimy black rot. By the end of November this rot had extended along the leaves for about half their length when I began the treatment mentioned below.

One level teaspoonful of very old air slaked lime sprinkled evenly over the top of the compost and thoroughly hosed into the compost. Four days later I did the same with a level teaspoonful of commercial bone dust, followed four days later with a soaking in a solution of Potassium Permanganate from an amount that would lie on a threepenny-piece dissolved in two gallons of water. That treatment was repeated three times at intervals of ten days

The *Cymbidium* has now, March, 1943, completely ceased to die back, and has sent up a sturdy, healthy growth, much more robust than one would expect from this plant.

It is to be noted that this *Cymbidium* was in a six inch pot, potted in, I believe, fibre, loam, and moss, and on purchasing this plant I was advised to repot it, which I did not do, so it is quite possible that this plant was suffering from a sour compost, although the compost is not soggy. Trusting the foregoing may be a help to fellow sufferers.

Compost—A Lesson from Nature

A. J. DALY, *Gympie, Q.*

● I have read articles in the Australian Orchid Review and elsewhere stating that *Cattleyas* in their natural habitat are frequently found on rock-faces, their roots rambling over the rocks, and in the crevices, where much decaying vegetation collects. Mr. A. J. McFie, a well known and old grower of Gympie, has taken a lesson from Nature and departed from the conventional todea, osmunda, or other fibres, and sphagnum moss. His large flowering *Cattleyas* are potted in a mixture of much charcoal and crocks, a little shell-grit, staghorn peat, and a good portion of dried, rotting wood and soil to be found in old stumps. I have seen him flower these plants consistently for the past four years, and the blooms are equal to any I have seen displayed in florists' windows or exhibitions. He gives *Cypripediums*, *Cymbidiums*, and *Maxillarias* similar treatment, but with more of the material from old stumps than is used for the *Cattleyas*. At present, March, 1943, his *Cymbidiums* look healthy and are showing spikes, while a hybrid *Cattleya*, and large pot of *Cypripedium Charlesworthii* in bloom, would make any Orchid grower envious. All plants are grown in a bush-house, and Mr. McFie, being a firm believer in "room for roots," all his plants are in large pots.

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begin to grow, for an eye will swell, new roots will be formed, and the old roots will begin to grow again.

Did I hear the female of the species remark, "Now, isn't that like a man."

1. When asleep do not disturb.
2. When sick do not feed.
3. When convalescing will let everybody know.
4. Feed the brute, his eyes will brighten and the wrinkles disappear from his middle.

● "*Dendrobium infundibulum*, a photograph of which I am posting, is grown in a bush-house, and is a small plant with only three stems, surprised me by producing nine large blooms, which lasted nearly two months in perfect condition."
—Miss K. McIlrath, Murwillumbah, N.S.W., 15/2/1943.

● ***Cypripedium Show.***—As the seasonal *Cattleya Show* proved a success, the O.S. of N.S.W., followed it up with a *Cypripedium* display on the 1/7/1943. A larger attendance showed its appreciation of the Society's previous effort, indicating that this type of meeting is destined to become very popular. The two hundred or more blooms of all shapes and colours brought together, enabled "Slipper" enthusiasts to make comparisons, and "tick off" desirable varieties. *Cypripedium x Gertrude West*, *C. x Warrior*, and *C. x. Donald Ayres* had many envious admirers. The sub-committee, which was the same that capably handled the *Cattleya Show*, has ideas about further shows.

The Determination of Species

H. M. R. RUPP, *Northbridge, N.S.W.*

Orchids are frequently sent to me for identification. Naturally, I cannot always satisfy the inquirer, and sometimes I am quite sure that my failure to do so is regarded as an exposure of my ignorance. Probably it is. In the course of many years I have learnt something about Orchids; a little about Orchids in general, and rather more about the Orchids of my own country; but the sum of what I know is an entirely insignificant fraction of what I don't know, and have never pretended to know. A man called on me one day and said, "I'm told you know all about Orchids." I hastened to assure him that he had been misinformed; the statement, like that about Mark Twain's death, was grossly exaggerated.

Occasionally inquirers complain, when a determination is given, that it does not agree perfectly with this or that published description of the species. But it is very important to realise that *no description,* however eminent its author, can be guaranteed as perfect and complete. This is equally true whether it be a family, a genus, a species, or a variety of a species, that is in question. These divisions are purely artificial human devices, adopted because if we wish to know anything more about plant life than that a pine tree is a pine tree and a seaweed is a seaweed, we are compelled to segregate plants into certain groups based upon their most fundamental relationships and differences.

The relationships and differences are the work of Nature; but with the man-made groups of plants based on a study of these factors, Nature has no concern. She will not produce perfect duplicates of a plant to conform with man's description of it under a hard-and-fast name. We call certain species "variable," but variability is found in every species; it is only a matter of degree. This is obvious enough at the top of the scale of creation, when you consider the species *Homo sapiens,* man himself. There are certain fundamental physical characteristics which make it easy for us to distinguish a human being from any other animal quite apart from what we term mental and spiritual qualities. But this does not mean that all human beings are exactly alike; on the contrary, we are aware that no two are exactly alike; they are only so much alike that you have no hesitation in placing them both in your group or species *Homo sapiens.*

Well, all this applies in plant life, too, and therefore, of course, in the matter of identifying Orchids. Let me try and illustrate. In the Australasian region are a large number of plants with the general characteristics of the group which we have already decided to call Orchids. But we find, further, that these particular plants, although often quite unlike each other, all possess certain features in common in their floral structure, which we do not see in other Orchids (or, at least, not in the same combination). In all of them, that part of the flower which we call the *column* is a slender structure with a pair of more or less hatchet-shaped wings at the top; and in all, this structure is sheltered under a kind of hood formed by the close association of the upper sepal and the paired petals. This combination is so constant and peculiar that we feel justified in putting all these plants into one group or *genus,* which Robert Brown named the genus of the Winged Column, *Pterostylis*, but which is more popularly known (from the more obvious of the features just mentioned) as the genus of Greenhoods.

Well, one day you are out in the bush, and you find two Greenhoods. Both have the column with the hatchet-wings; both have the protecting hood formed by the dorsal sepal and paired petals. Yet you say unhesitatingly, "These are not identical." Why? Well, one has a rosette of leaves all at the base of the stem; the other has leaves alternating up the stem. One has a solitary flower of moderate size, so much bent over that it faces the ground; its narrowly-oblong labellum ,or "tongue," is almost hidden under the hood, and is quite bare; its lower or lateral sepals lie almost horizontally across the bent hood. The other has a number of smaller flowers in a terminal raceme, all erect or very slightly inclined forward. The labellum is prominently exposed in front, it is short and broad, densely hairy near the tip. The lower sepals are sharply deflexed under the labellum.

No, decidedly they are not identical, though both are Greenhoods. You hunt up descriptions, and find that you have got the Nodding Greenhood (*P. nutans*) and the Long-leaved Greenhood (*P. longifolia*). A few days later you find, as you think, some more *P. nutans*; then it strikes you that the flower is much smaller, and is more or less hispid with very short glandular hairs, especially about the labellum. A new species? You send it to someone who is supposed

Continued on page 41

"Saying it with Orchids"

J. MURRAY COX, *Brisbane, Q.*

Continued from the June, 1943 issue

But the echo of your firing squad is the distant rumbling of the thunderbolt that approaches to tumble your ambitions into ashes. Poor weak silly fool—I grieve not for myself but for you—"

"Shoot him," screamed the Fuhrer, his face twitching. "He has committed blasphemy."

Ethelbert made no resistance as two of the storm troopers forced him against the walls of his floating glass-house.

A quick command, a burst of fire—the tinkling of glass—a sensation of falling—falling and Ethelbert knew no more.

* * *

Diana Smithers started up in her twin bed. Ethelbert was sitting on the floor, the fragments of the warm-house scattered about him. He was rubbing his eyes dazedly.

"Whatever is the matter, Ethelbert?" snapped Diana.

Ethelbert rose slowly to his feet. He walked to the wardrobe and commenced to dress.

"Where are you going?" asked his spouse.

"I'm going to wait on the doorstep of the Defence Department," said he, "and if they won't take me for a soldier I'm damned if I don't buy a plane and bomb that maniac Hitler myself. He's a menace to every decent man and woman, and to every ideal that mankind has striven for since the dark ages."

"But what about me and the children?" faltered Diana.

"You'll be well provided for, and anyway, until Hitlerism's destroyed there's no security and no future for anyone."

"But what about your orchids?" wailed the woman in a last desperate attempt to weaken his evident resolution.

"My orchids?" sniffed Ethelbert. "When you want to reason with a raving maniac you've got to argue with an axe—it's a waste of time saying it with orchids!"

He went out of the bedroom and slammed the door.

Diana wept quietly.

Dendrobium infundibulum, Lindl.
Grown and photographed by Miss K. McIlrath, Murwillumbah, N.S.W.

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SEPTEMBER, THURSDAY, 30th
OCTOBER, THURSDAY, 28th NOVEMBER, THURSDAY, 25th
at Room 507, Phillip House, Phillip Street, Sydney

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Volume 8 **DECEMBER, 1943** No. 4

The author of each article is responsible for the facts and opinions expressed therein.

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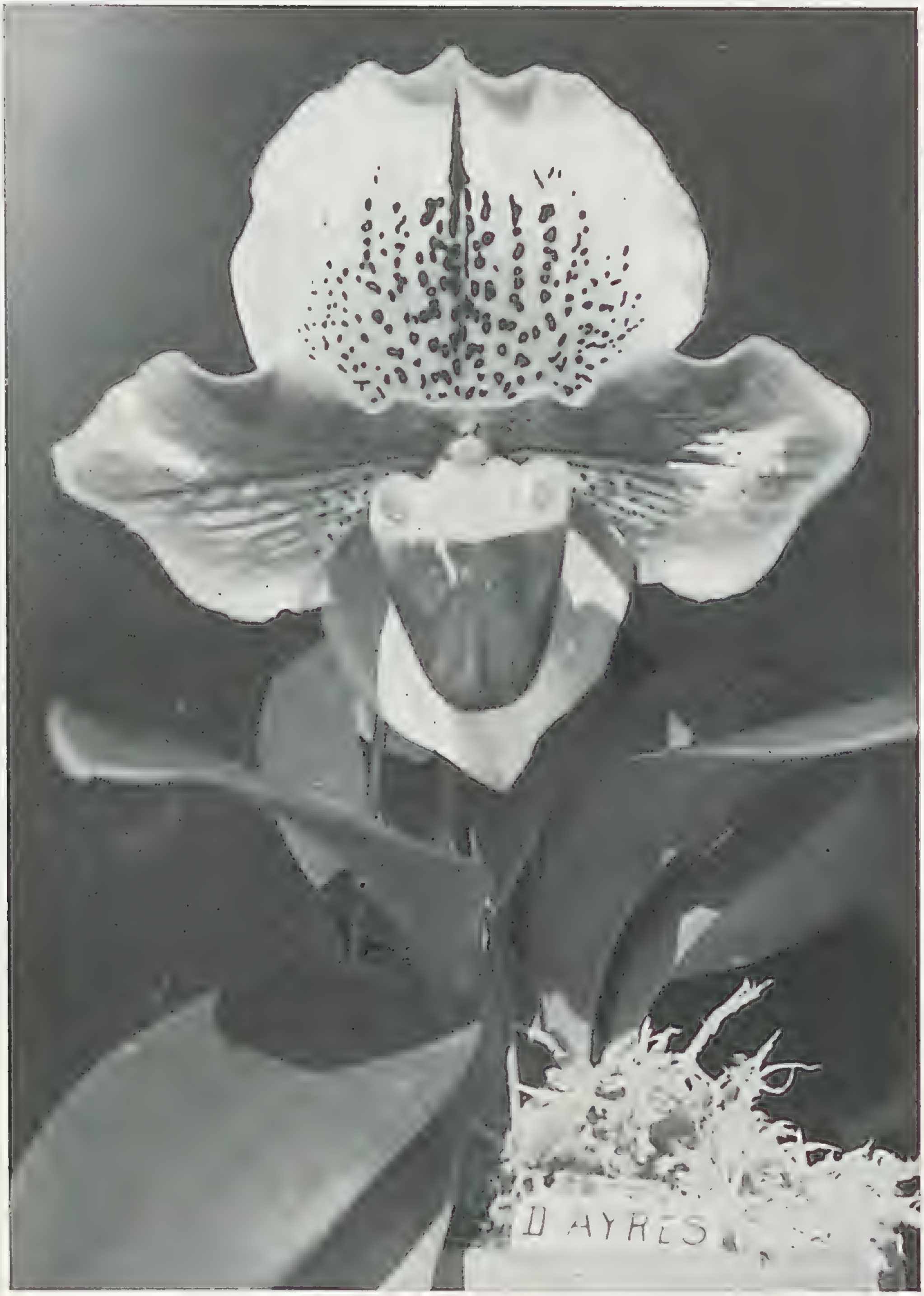


CYPRIPEDIUM X DONALD AYRES
(Approximately two-thirds natural size). *Grown by W. Fahey.*

Orchid Mosaic

Dr. C. J. MAGEE, *Dept. of Agriculture, Sydney, N.S.W.*

● Recently I was requested by Mr. C. C. Hildebrandt, a member of the Orchid Society of New South Wales, to make an inspection of his *Cymbidium* collection for the purpose of diagnosing a disease which I understand is well known in the Society as the "Black disease." A few only of Mr. Hildebrandt's plants were affected.

I formed the opinion that this disease was a virus disease and would, if we followed usual nomenclature, be better named *Orchid* or *Cymmidium mosaic*. The classification of the disease is helpful because it allows us to draw upon a fund of information about this kind of disease gained in the study of similar diseases of various crop plants. Examples of virus diseases with which you will be familiar are Bronze or Spotted Wilt disease of tomatoes, Bunchytop disease of bananas, Woodiness disease of passion fruit, Crinkle disease of strawberry, Breaking in tulips, etc. Each of these diseases has a characteristic effect on the plant, but the general action of the virus is to debilitate the plants rather than to blight or kill them. So it is with *Cymbidium* or Orchid mosaic. The first sign of this mosaic is a yellow flecking or streaking of the youngest leaves, followed later, as more leaves emerge, by the development of black spots and streaks on both the upper and lower surfaces. Growth is retarded and plants lose vigor. Different varieties vary in their response to the disease and some, in spite of the disease, continue to appear quite vigorous. As far as I know, Orchid mosaic has not been formallly described in plant disease literature, and I have had little opportunity to search through horticultural journals. I am thus unable to indicate whether infected plants will eventually flower, but judging from similar diseases on other plants it is thought that some of the less sensitive or tolerant varieties will do so without much deterioration of bloom, but that the flowers of other varieties will suffer greatly.

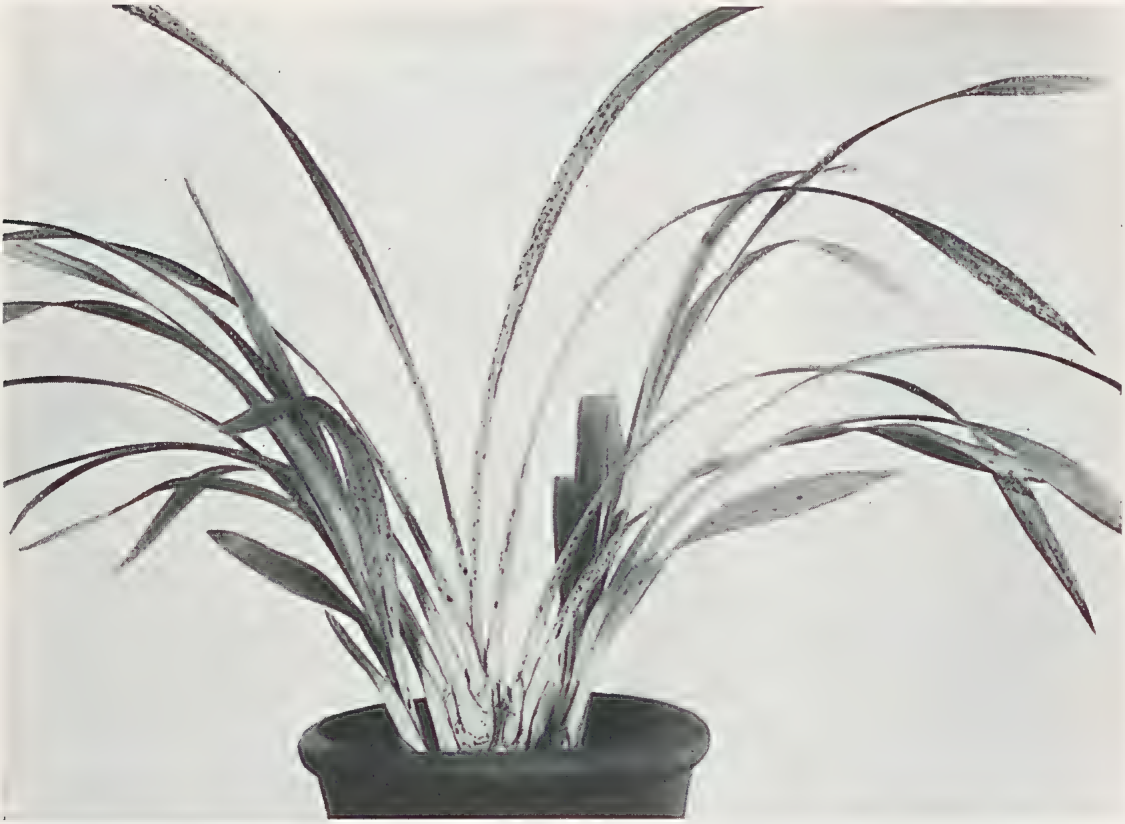
It will be as well to digress a moment to establish a background for an understanding of virus diseases in general. Virus diseases are distinguished from other infectious diseases, i.e. those caused of bacteria and fungi (i.e. the "germ" diseases) by the fact that the infectious agents which cause the disease are not visible in the plant even with the aid of the microscope. There is now good evidence to suggest that the viruses are not germs but complex protein substances with unusual properties of regeneration when introduced into the appropriate kind of plant.

Certain viruses are highly infectious while others are much less so. In the case of the more infectious types the rubbing together of the foliage of diseased and healthy plants, or the handling of plants during cultural operations, will result in the transfer of the disease. In the majority of cases, however, the natural spread of the virus cannot take place unless insects such as aphids, thrips, or plant bugs, play a part in the transfer.

While most virus diseases are not carried over from season to season in the seed, it is a most unfortunate feature that virus diseases are almost invariably perpetuated in the vegetative parts of plants used in propagation, such as cuttings, buds, tubers, runners, corms, roots and bulbs. In the case of horticultural crops this means of dissemination is mainly responsible for the widespread occurrence of virus diseases, and the multiplication of virus centres or "reservoirs" by insects is sometimes quite subsidiary. It might be mentioned that virus diseases are also referred to as "degeneration" diseases, an old term which had its origin in the erroneous conception that long cultivation of vegetatively-propagated plants in the one locality without change of stock led to degeneration or "running-out." In every case where investigation has been made, degeneration of stocks of plants, such as named varieties of potatoes, strawberries and ornaments such as *Lilium* spp. *Narcissus* spp., etc., has been found to be caused by the accumulation of virus diseases either as a result of propagation of diseased parts alone, or by propagation assisted by insect transmission.

Virus diseases are insidious in their development. They are the fifth columnists amongst diseases—by the time the plant cultivator realises they are present and is able to take appropriate action they have destroyed the stock, crop, or the industry, as the case of banana Bunchy-top in 1923.

The precise relationship of Orchid mosaic virus is not yet known. The virus is possibly the Spotted or Bronze Wilt virus, and if so, would be carried into Orchid collections by infective (virus carrying) thrips migrating as adults from neighbouring infected crop plants



CYMBIDIUM X RIO RITA

Showing Orchid mosaic. Note whitish flecking as well as black spots and streaks.

Photograph by courtesy of the Department of Agriculture, N.S.W.

and weeds, such as Nasturtiums, Zinnias, Iceland poppies, Arum lilies, and a host of other garden plants.

The virus might be the lily mosaic virus which is very common in the cooler months of the year, affecting lilies, curcurbits, Passion-fruit, and numerous weeds. In this case the virus would reach the Orchids by means of aphids migrating from diseased plants. Until an investigation is made it is not possible to decide which virus is concerned, but the probability is that it is the Spotted Wilt virus.

Now, regarding measures that might be taken by Orchid growers to restrict the disease. Firstly, it is most important not to propagate plants that show any sign of yellowish or whitish streaking of the youngest leaves. The blackening of the foliage is a general guide but a number of other agencies, such as cold winds, scale insects, and mechanical injury, might cause blackening. To discourage propagation it is of course desirable for intending purchasers to scrutinize the new plant well before buying. It is not thought feasible at present to adopt spraying to poison migrating thrips, as is done by tomato growers, but drastic attention should be given to weeds and infected ornamentals growing in close proximity to the collection. Until more is known about the virus it would be a wise precaution to isolate Orchids infected with mosaic.

Orchid mosaic has also been noticed infecting a species of *Dendrobium.*

● ***Drymoanthus.***—A new genus for Australian Orchidology. In the Victorian Naturalist, February, 1943, Vol. LIX, No. 10, Mr. W. H. Nicholls describes the above genus, which is illustrated with his usual skill. "It constitutes the type of the new genus, and is allied to *Sarcochilus*, R Br." Mr. A. Glindeman, of Queensland, is the discoverer, subscribers to the A.O.R. having had the pleasure of reading about his interesting adventures in the jungles and forests of Queensland.

Vandas—Terete and Semi-Terete

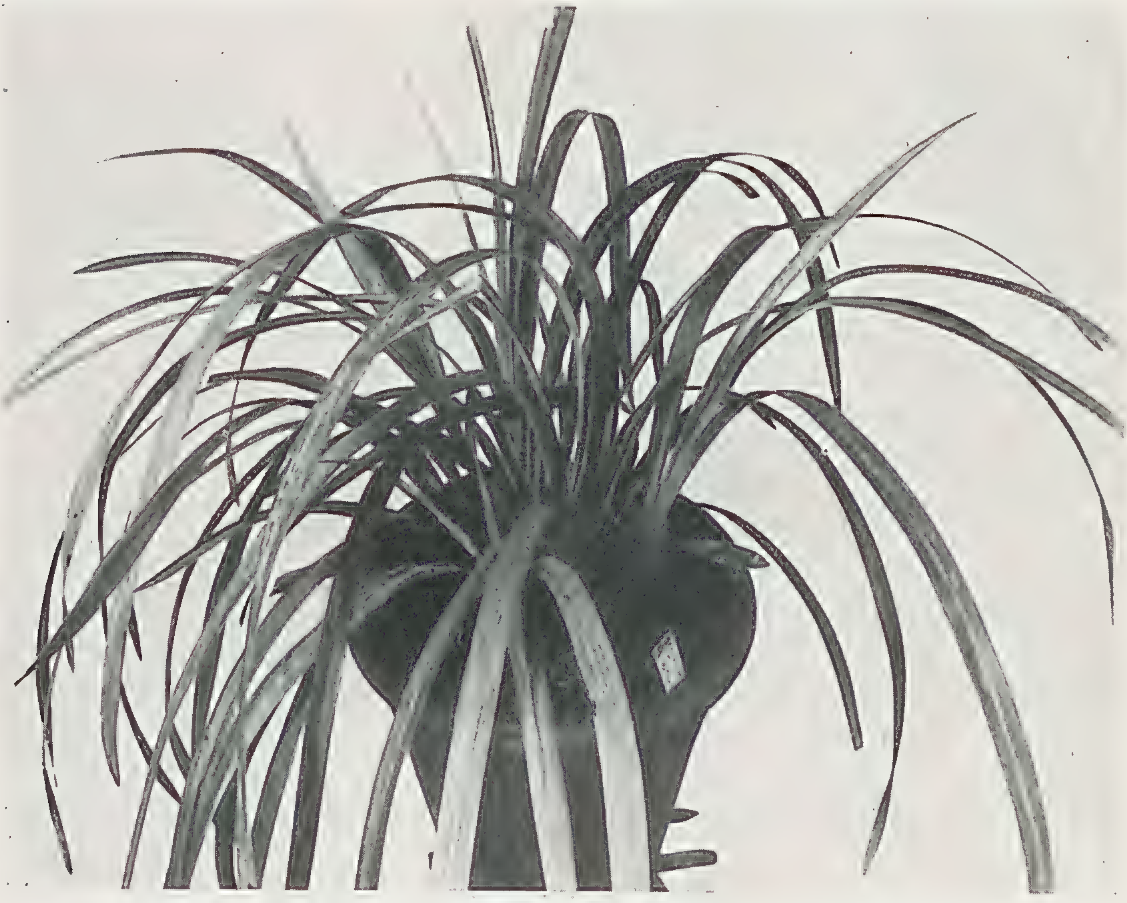
J. GORDON SMITH, *Brisbane, Q.*

● *Terete.* Having previously dealt with the culture of Vandas of the flat leaf type such as *coerulea, sauvis, and tricolor,* I now propose to speak of Vandas of the terete type. These are so called because of their tapering cylindrical leaves and stems. They have short fleshy leaves, slightly channelled down the face and a thin stem from which the plant puts out numerous roots at varying intervals; these roots act as supports for actually the terete Vanda is a climber.

Unlike the other members of the Vanda family they revel in direct sunlight, so that they grow and bloom much better in the open garden than in a glass- or bush-house. They can, in my opinion, be grown in two ways. In both cases stakes should be firmly driven into the ground or some form of trellis arranged up which the plants can climb.

A. In pots set into the ground and surfaced with grass clipping or dead leaves to help to retain the moisture and keep the ground cool. The compost used is as follows:—1 part Osmunda fibre, ½ part She-Oak needles, ¼ part creek sand, ¼ part cow manure, the fibre and needles being cut into small pieces, and the whole thoroughly mixed. Planted in this way the plants grow well and bloom freely.

B. In a trench, say 9 inches deep. First place a layer of crocks or stones at the bottom of the trench to provide drainage, then a layer of grass or leaves and fill the trench with cow manure. This method appeals very much to me, but as I have only recently adopted it, it is too early yet to speak of results. However, I have noticed that roots which have got into the soil outside of a pot, immediately start to spread, in one case the root on reaching the soil branched in five



CYMBIDIUM X ATHENS

Infected with Orchid mosaic. Note prominent whitish flecking of leaves with little or no blackening.

Photograph by courtesy of the Department of Agriculture, N.S.W.

different directions, each going about 6 inches into the soil. This root had got into a piece of manured soil and the roots which passed into the soil were 3 to 4 times thicker than any other root in the pot, all of which were healthy and strong.

The culture of terete Vandas is so simple that anybody can grow them and have an attractive show. The terete Vandas are *Hookeriana, tricuspidata,* the *teres* group of about 11 varieties, and the natural hybrids *Cooperi* and *Miss Agnes Joachim.*

Vanda Hookeriana seems to be very difficult to grow away from its natural abode. It is found at sea level in Malaya.

Vanda tricuspidata comes from the Malay Archipelago, it is rather slower in growth than the rest, it is easily grown from cuttings, but is a shy bloomer.

Vanda teres and varieties. We have *teres, teres alba, teres Andersonii, teres aurora,* and *teres langalabia,* all these grow and bloom well here. *Aurora* is the largest bloom, while *alba* is perhaps the most beautiful bloom of the group.

Vanda Cooperi is a natural hybrid, the parents are believed to be *Agnes Joachim* and *Hookeriana,* so far this Vanda is unknown here.

Vanda Agnes Joachim. Another natural hybrid, the parents being *Hookeriana* and *teres,* grows and blooms freely with us. This Vanda for years supplied the bulk of the cut flowers in the East. This doubtless had a lot to do with the introduction of hybrids.

Semi-Terete.—This type of Vanda is a very welcome addition to the hybrids and is the result of crossing the flat leaf and terete types. They have leaves of varying lengths which are sub-cylindrical, being deeply channelled down the face, thick cylindrical stems which put out roots in the same way as the terete type.

All the good features of the parents are apparent in these plants, the thick stems and robust growth are characteristic of such parents as *tricolor* and *sauvis.* The blooms are of good quality, being a charming blend of colours; they are carried on long spikes and last in perfect condition for a long time. The following are among the best of the semi-terete type:—

Vanda Emma Van Deventer (V. tricolor x V. teres), Vanda Mrs. Dinger (V. Miss Joachim x V. tricolor), Vanda Marguerite Maron (V. teres x V. sauvis), Vanda Rosalia (V. foetida x V. Miss Joachim).

We have yet to see *V. Emma Van Deventer* bloom. It is said to be the finest of the hybrids, and has received high praise from growers in the East. The other three have produced delightful blooms and we look forward with keen interest to the flowering of *Emma Van Deventer,* for it must indeed be a beautiful bloom.

Given the right conditions, the semi-terete Vandas make rapid growth and freely produce their blooms. *Marguerite Maron* and *Rosalia* have a habit of making side growths, and these when large enough can be removed, potted up and when established can be planted out shortly to become flowering plants.

I find that the culture as outlined for the terete Vandas is satisfactory for the seme-terete.

A small white scale attacks both types, but it is easily removed and kept in check. A regular spraying with soapy water and nicotine is all that is necessary. The grasshopper is the greatest worry; it seems to have a weakness for the tips of the leaves. *Agnes Joachim* in particular, seems to be a tasty morsel for this insect.

Both types can absorb copious supplies of water from early spring till late autumn, but it is advisable to keep them just damp during the winter.

● "The Red Cross" Orchid exhibition held at the Y.M.C.A. hall on September 9, 10, 11, 1943, was very successful, for there were indeed some beautiful *Cymbidiums.* One plant of Mr. W. Rothwell's, which took five men to carry, was a sight to view, having 192 perfect blooms. It was a green *Swallow,* and had many admirers. A lovely green *Swallow* shown by Mr. C. Cambourn, also caught the eye with its outstanding colour, a real jade green with a lovely pale pink flush in the lip, which was improved greatly by the night light.

Mr. G. Tosi exhibited a *Dorchester,* which, I hear, is now a perfect flower, as it was not at its best when exhibited.

Another outstanding plant exhibited was *Ceres x Regali,* a very beautiful colour. Over 3000 viewed the plants.

Professor Waterhouse's Camellias were worth a visit, and we thank him for all the lovely blooms he gave us to sell each day. I thank all the workers and exhibitors for all they did to make the show a success.—Matron F. Burt, 20/9/1943.

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"Should Orchids Have Neighbours?"

H. B. STEVENS, *Brisbane, Q.*

● In presenting to you my paper entitled "Should Orchids Have Neighbours?" I was prompted to submit it in consequence of a remark made by the President of the Queensland Orchid Society, Mr. J. Gordon Smith, on the night of his election to the chair. He appealed for papers on something new, something that would create interest, something that would depart from the usual stereotyped hard and fast material. My paper may appear somewhat unusual, and, perhaps, I am departing from the usual lectures confined to Orchids only.

Being an ardent supporter, and a keen grower of pot plants, I naturally advocate that Orchids should be intermingled with pot plants, and hanging baskets, in your bush-houses or glass-houses. In so doing I submit that we should first of all consider our plants as they would be found in their natural haunts and habitats.

Where are the majority of Orchids grown by us found in natural surroundings?

First, in the tropics adhering to some form of vegetation, etc.

Second, in moist places among the mosses, etc.

Third, bordering swamps among the undergrowth and such like places.

Let us then take for an example a species which, perhaps, we are all conversant with, *Dendrobium speciosum,* which is readily found in the majority of our nearby scrubs.

This beautiful specimen usually adheres or fastens itself to finely foliaged trees, and sometimes to rocks in gorges; by so doing it makes extensive root growth which enables the plant to gather food from decayed vegetation (leaves lodging among the pseudobulbs and root growths) to store up sufficient moisture to tide it over dry periods, and eject any surplus moisture during the rainy season. When in bloom, the foliage of the trees affords a striking contrast, while among the plants adhering to the rocks are found various kinds of ferns growing among the root growths. These ferns afford a background, and a contrast to the blooms, and so the Orchid enjoys the presence of its neighbours.

Let us then follow nature, and so arrange our Orchids, particularly Dendrobes, whose natural habits seem to be to discard some of their own foliage and arrange themselves among foliage plants to liven up the so-called "dry-sticks" in the non-flowering season. It does not take many foliage plants, carefully selected to alter the complex of the surroundings.

Think what an improvement it would be to your *Cypripedium* bench, if a few small palms, or particularly *Adiantums,* or even *Lycopodiums* were dotted her and there. The plants would begin to think they were back home again in their natural habitats.

Now, the *Cattleya* family. Allowing for the majority to be cultivated in baskets, what would be more effective and pleasing to the eye than to see intermingled among the plants a few beautiful hanging baskets of the fern *Davallia, Fijiensis,* for instance, or the maiden-hair fern, *Adiantum x Gloria Mordrecht,* or even that rare and beautiful plant, *Nepenthes,* more commonly known as "pitcher plant."

Again our attention must be drawn to the advantage of having pot plants mixed with Orchids. Your pot plants require more watering than your Orchids do, particularly in resting periods, therefore the Orchids, by evaporation, are kept sufficiently moist to obviate the necessity of specially watering them.

Let me call your attention to where the Queensland Orchid Society successfully, in the past, held its Annual Show of Orchids, also its display at the Annual Show of the Royal National Association. How our worthy Hon. Secretary, Mr. T. C. Harveyson, appealed for ferns, foliage plants, and greenery, in order to show up the beauty of the Orchids, and afford a neighbourly contrast. I hope in my words of conclusion to have won a few who are admirers of nature, and think on the same lines as myself, who will improve the surroundings of their Orchids by the addition of suitable pot-plants or hanging basket plants.

His Honour Judge H. F. Markell, who had been President of the Orchid Society of New South Wales since its formation, retired from that position at the last Annual General Meeting, and did not seek re-election. Subsequently the Society unanimously elected him as a Life Honorary Member, in gratitude for the great assistance he has rendered in building up the Society.

His Honour has graciously consented to become patron of the Society.

Orchid Shows (1943)

P. A. GILBERT, *Lakemba, N.S.W.*

● *Cattleya Show.*—The O.S. of N.S.W. held a special show on the 31/3/1943, which was largely attended by members and their friends. About twenty exhibitors staged fifty-five plants carrying one hundred and forty odd flowers. This first effort can be pronounced as being very satisfactory, both socially and as an exhibition, as enthusiasts were able to study, criticise, or admire the beautiful display without the formalities associated with monthly meetings. *B. C. x Elaine, B. C. x Atlantis* were particularly fine example of the *Cattleya* group of hybrids. Many other fine varieties were noticed, and keen growers noting them on the spot, they need not be mentioned here. The show was successfully organised by a sub-committee—Messrs. E. A. Hamilton, W. Fahey, W. Palmer.

● The O.S. of N.S.W. sectional show for the *Cymbidium* season was held in the Austral Salon, Elizabeth Street, on September 29, 1943. So far as the exhibits were concerned, the show was an outstanding success, the range of colour excelling that of either the *Cypripedium* or the *Cattleya* show. The various shades and tints of colour viewed *en masse,* formed a remarkably impressive picture. There was not an inferior flower shown, the quality in the aggregate being superior to that of any previous show held by the Society. Unfortunately, the record storm which swept Sydney earlier in the day, discouraged many enthusiasts from attending. Nothing but praise can be bestowed on the exhibitors and the sub-committee for seeing the fixture through.

There was a particularly fine presentation of reds, pinks, mauves and Orchid-purples in the display, as they appeared under electric light, and standing well away from the exhibits, one was especially attracted by the refined and perfect flower of Dr. J. A. Vote's *Cymbidium x Cassandra*—white with a very faint suffusion of Orchid-purple uniformly distributed throughout the sepals and petals. Nearby stood Mr. C. C. Hildebrandt's *C x Cordelia*—superlative in the density of its reddish coloration. Between these extremes of colour, intermediate shades and tints filled in the colour scheme, Mr. W. Rothwell's *C x Cyzarra,* Mr. A. B. Porter's *C x Merlin x Wheatear,* and Mr. N. MacDonald's *C. x Ceres* being conspicuous in helping to complete the gradation.

The Committee's limitation to the number of plants an exhibitor could display ensured that only the best would be exhibited, quality being better than quantity in demonstrating the magnificence of *Cymbidiums,* or bringing about an increase in the adherents of these lovely Orchids.

Busy times are ahead, as the Committee intends to formulate rules to govern the allocation of First Class Certificates, Award of Merit, Cultural Commendations, Botanical Certificates, and any other awards to meet special classes of exhibits.

The following are the exhibitors, and the number of plants shown by each exhibitor. The names are for *Cymbidiums,* except where a name is given fully. Errors and omissions of nomenclature, if any, are due to faulty, or the absence of, labels.

Mr. D. Petherbridge, 1.—*Coelogyne* species, well grown carrying eleven small white and brown flowers. D. Petherbridge is on active service with the A.M.C.

Mr. R. Dart, 2.—*Cassandra,* and *Helen,* lip with dark red V, unusual coloration, greenish sepals and petals with red markings.

Mr. W. Rothwell, 3.—*Claudette* extraordinary large lip; *Cyzarra* rich in colour, rose-purple, sepals and petals uniformly coloured, lip darker, the three lobes being coloured; *Ruskin* yellowish with red V on the lip.

Mr. E. A. Hamilton, 2.—*Alexanderi* and *Nadina,* two attractive varieties.

Dr. J. A. Vote, 5.—*Cassandra,* two varieties; *Gossoon; Dendrobium x Ainsworthii, D. Chrysanthum,* well in flower, unusual, late summer or autumn being the normal flowering season in N.S.W.

Mr. Deggenhard, 3.—*Cypripedium x Stornaway; Cyp. x Perseus; Ornithidium orchraceum.*

Mr. C. C. Hildebrandt, 6.—*Janette* large and showy, nice shape; *Princess Margaret; Cordelia,* dark reddish colour, rare among *Cymbidiums; Louis Sander* large size, good shape and colour; *Dendrobium thyrsiflorum, Lycaste Skinneri.*

Mr. P. L. Meech, 4.—*Gossoon* pale yellow, large lip with bright red patch on the tip (distal end); *Louis Sander* bright Orchid purple; *Profusion; Cypripedium sublaeve.*

Mr. E. W. Usher, 3.—*Princess Elizabeth,* two nice plants of this popular variety; *Swallow, W. B. x Pauwelsii; mag.,* large open lip mottled with bright red.

Mr. W. Fahey, 1.—*Ceres, F. J. H.,* bright red, broad V on the front of the lip, sepals and petals uniformly coloured.

Mr. R. Richards, 1.—*Eclipse,* small flower, good colour, the entire lip freely striped and mottled with dark red.

Mr. N. MacDonald 6.—*Bodmin Moor; Ceres, mag.,* pale yellow lip completely striped with bright red; *Eagle; Lowio-grandiflorum x Rosanna; Ceres Robin; Potinara x rosita.* The *Cymbidiums* were a bright and colorful selection.

Mr. J. Bisset, 1.—*President Wilson,* nice variety.

Mr. C. Cambourn, 4.—*Stonechat; Armynell,* large open lip heavily coloured with bright red, not fully out but appeared to be of a very good shape; *Alexalban;* a *Joy Sander x.*

Mr. A. B. Porter, 3.—*Merlin x Wheatear,* very showy, evenly coloured, the sepals and petals pale Orchid purple finely spotted with darker colour, the lip and three lobes completely coloured; *Vesta; Brugense.*

Mr. W. Worth, 4.—*Bay Ridge; Bletia hyacinthina; Sarcochilus Hartmannii; Cypripedium x Aton.*

Mr. A. Royce, 1.—*Lowianum,* var. *flaviflorum,* sepals and petals very pale green, lip pale yellow with a pale red V on the front.

Mr. L. F. Hawley, 2.—*President Wilson,* good variety; *Sunbeam* also a good variety with a faint green shading, showy.

Mr. C. H. Deane, 6.—*Joy Sander; Louis Sander; Armynell; Plover,* good variety; *Swallow; Cypripedium* hybrid; the *Cymbidiums* made an attractive group.

● Mr. J. Bissett can rightly claim to be the pioneer of competitive trade Orchid Shows in Australia. The confidence that the public, and the Orchid growers have in his method of conducting his shows, was exemplified by the recent display in David Jones' Auditorium, Sydney, on September 15, 16, 17, 1943.

Described as a Grand Orchid Exhibition in aid of the Kindergarten Union of New South Wales, it immediately appealed to the public whose liberality was responsible for raising the considerable sum of £352. About 15,000 people attended the show during the three days.

This was J. Bissett's sixth annual competitive show, and each year one can see a steady improvement in the quality, and colour of the exhibits. The *Cymbidiums* in particular call forth many enconiums. The improvement shows how the persistency of effort of the hybridist is gradually transforming these delightful and stately flowers.

This improvement, of course, is largely due to the enthusiasm of specialists who are continually on the hunt for novel, unusual, or standard varieties, and the consequent effort of the trade to meet this enthusiasm. J. Bisset has helped in bringing about the situation, and one can hear nothing but praise, from all interested, in support of the enterprising way he has organized his exhibitions. That is not to say his organization is perfect, but with more attention to minor details, such as labelling, and the artistic display of exhibits, his shows would be well on the road to becoming so.

The inclusion in the 1943 schedule of two special prizes, one for culture, and one for colour regardless of the niceties of shape, will encourage and extend the interest in *Cymbidiums* generally, attracting more *colour* to, and greater interest in, his shows.

The sum of £28/7/- was distributed in cash prizes, and a silver cup was donated for the best *Cymbidium.*

Mr. L. F. Hawley, Lindfield, N.S.W., was the most successful prize winner, his trio being the best so far exhibited in Sydney. With it he won the J. Bisset Silver Cup, group of three best *Cymbidiums,* and first for distinctive colour.

The schedule and prizes are as follow:

"The John Bisset Silver Cup," won by L. F. Hawley with *Cymbidium x Cassandra.* Group of 3 Best *Cymbidiums,* First, L. F. Hawley—*Cassandra, Carisbrook, Ceres F. J. H.* Second, W. Fahey—*Ceres F. J. H., Swallow, W. B. x Pauwelsii, Jeanette.* Third, Dr. A. C. Burstal—*Altair, Pauwelsii x Apollo, Louis Sander.* Group of 3 *Cymbidiums* judged on the basis of distinctive and attractive display with regard to colour and floral arrangement. First, E. A. Hamilton—*Erica Sander, Peri, Hera x Gattonense.* Second, C. Carter—*Gattonense, Canary, Pauwelsii x Corona.* Third, Dr. A. C. Burstal. Group of 2 Best *Cymbidiums.* First, F. L. Hawley—*Galaxy, Eagle.* Second, E. W. Uusher—*Lyoth, Princess Elizabeth.* Third, R. Dart—*Pearl, Prince Baudouin.* Group of 3 Orchids (excluding *Cymbidiums*). First, Dr. J. A. Vote—*Coelogyne cristata, Oncidium splendidum, Phaius Wallichii.* Second, W. Fahey—*Ornithidium ochraceum, Lycaste Skinneri, Saccolabium giganteum.* Best *Dendrobium*: First and Second, Dr. J. A. Vote — *Austini, Chessingtonense.* Best *Cattleya*: First, L. F. Hawley — *Blc. Vivian Simon.* Second, Dr. K. Kirkland—*Bc. Beryl Fleming.* Best *Cypripedium*: First and Second, W. Fahey—*Deepdene, Stonaway.* Best Orchid (outside the above genera): First, Dr. J. A. Vote — *Phaius Wallichii.* The *Cymbidium* judged to have the most distinctively coloured flowers: First, L. F. Hawley—*Carisbrook.* The

Cymbidium judged to be the best specimen plant having regard to culture, attractiveness of display, number and general quality of the flowers: First, C. Carter—*Canary*. Shoulder Spray of *Cymbidiums*, judged by Miss Beatrice Stewart: First, Mrs. L. F. Hawley; Second, Mrs. W. Fahey; Third, Mrs. W. Worth. The Hon. Official Judges were Messrs. P. A. Gilbert, S. C. James, T. H. James.

Special mention must be made of an exceptionally fine non-competitive display, by Mr. L. G. Cohen, of green-house and hot-house foliage plants, as well as Orchids. Every plant was well grown, the mass of greenery forming a restful scene for the eye. Various Orchids were set here and there among the foliage, *Blc. Helmsdale* and *Blc. Blandford* standing out from the background of green. There were a few nice *Cymbidiums* hidden away from prying eyes.

One prize only was allotted to the championship (J. Bisset Cup), but following were judged as nearest to the winner: Second, E. W. Usher—*Princess Elizabeth.* Third, L. F. Hawley—*Carisbrook.* Highly Commended, Dr. A. C. Burstal—*Altair.* Commended, L. F. Hawley—*Eagle*, and R. Dart—*Pearl.*

● Anthony Horderns' Orchid Exhibition, organized and supervised by Mr. C. H. Deane, was held in their Fine Art Gallery, on September 22, 23, and 24, 1943. The Exhibition, which was in aid of the Australian Comforts Fund Christmas Appeal, was opened by His Honour Judge Markell on September 22, His Honour presenting the prizes on the following Friday. The sum of £212 was collected for the Fund.

Great interest is taken in the destiny of "The Sander Cup," which has been presented by Sanders (St. Albans) Ltd., England, for the best group of Orchids of not less than twelve plants. The cup is held by the winner for one year, and if an exhibitor succeeds in winning the cup three times, he becomes the outright winner of it. Another item is the "First Prize Bowl" for the best collection of six Orchids, the presenter, and conditions of ownership, being the same as for "The Sander Cup."

The public thronged the display to the point of being uncomfortable, many thousands of interested people examining the beautiful show of flowers during the three days. More attention to the details of display, such as conspicuously naming hybrids and species will correspondingly add to the educational value of the Exhibition. Groups of exhibits representing classes should also be clearly marked, so that the onlookers can view the various classes without confusion.

Dr. J. A. Vote seems to be making a determined effort to permanently hold "The Sander Cup" and the "First Prize Bowl," as he is holding these trophies for the second year in succession, and it looks as if it will take a grower with the attributes of a wizard to prevent him from becoming the outright winner.

The schedule and prizes are as follow:

The Sander Cup: First, Dr. J. A. Vote. The Sander First Prize Bowl: First, Dr. J. A. Vote. Best *Cymbidium;* E. W. Usher—*Princess Elizabeth.* Best *Cattleya*: Dr. J. A. Vote—*Blc. Empire.* Best *Cypripedium*: Dr. J. A. Vote—*Perry Cowburn x Ely Rosemary.* Best three *Cymbidiums*: First, E. W. Usher—*Princess Elizabeth*, two plants of *Swallow, W. B. x Pauwelsii Mag.* Second, Dr. J. A. Vote—two plants of *Cassandra, Glascow Enchantress.* Third, C. C. Hildebrandt—two plants of *Louis Sander, Janette.* Best three decorative *Cymbidiums*: C. C. Hildebrandt—*Cordelia, Veronique, President Wilson.* Best plant of any other variety of Orchid: Dr. J. A. Vote—*Phaius Wallichii.* Best specimen plant of *Cymbidium*: D. Adamson—*Swallow.* Twenty-one guineas were distributed in prizes.

● During the year Messrs. Searls & Jeans, of King Street, Sydney, lent their display windows for an exhibit of choice *Cypripediums* by Taylors Orchids, of Belmore.

The lovely, well grown speciments attracted continuous attention from the host of passers-by in this busy thoroughfare, and were at all times the centre of a circle of admiring onlookers attracted by the spectacle of exquisite form and colour of the ever popular "slipper" Orchid.

Apart from the beauty of the blooms, the artistic arrangement reflected the greatest credit on all concerned.

● ***Oncidium flexuosum.***—A species of the creeping rhizome type with which Mr. T. H. James has had extraordinary success, and for which he is well known. His plant crept all over a large block of hard fibre, covering its flat surface in luxuriant profusion. It was clean and obviously healthy, and just coming into flower, there being 13 spikes in all. The four spikes in flower carried many small flowers, subdued in colour toning, but attractive, and when the plant is freely and fully flowering it should be something that any Orchid lover would be glad to own. It i sa rapid grower, and started originally as a small piece given Mr. James by Judge Markell. It is grown on hard fibre in the cool glass-house, and is copiously watered, summer and winter, perfect ventilation and evaporation of water making this necessary and possible.—J.A.V. (28/1/1943).

Phalaenopsis Rosenstromii

T. T. TAYLOR, ***Macknade, Nth. Q.***

● This article is intended to convey to Orchid growers some idea of just how this beautiful Orchid grows in its natural habitat, and the following particulars should be of some assistance to those who are experiencing difficulty in its cultivation.

In one section of the Seaview Range of mountains, North Queensland, on its seaward side *P. Rosenstromii* is still fairly numerous notwithstanding the large number that has been taken in recent years. I am familiar with a locality in which there are four or five creeks running down through dense tropical jungle in an easterly direction, and it is here that this Orchid may be found growing on trees anywhere from three hundred to seventeen hundred feet above sea level, but no *Phalaenopsis* will be found below the point where the waters of any creek disappear underground during the dry season.

At certain places along the waterways where the moisture laden air is fanned over to one side continually by the trade winds, the species is located on that side only. This combined with an average rainfall of one hundred and twenty inches indicates that a very moist atmosphere is essential for their successful growth.

Most of the plants are clinging to the trees about fifteen feet above the ground, but I have come across them in full bloom only three feet up on vines, while others may be seen high up on the limbs of the tallest scrub trees, and any species of tree suffices as a host. The plants are usually found in colonies of as many as thirty, and occasionally eight or ten are clustered together, not as one plant, but as a family of plants with their roots entwined. These may be separated and planted singly.

Plants growing in the jungle where the sun's rays do not penetrate are invariably large, with dark green coloured long leaves, and are usually shy bloomers. On the other hand, plants which receive filtered sunlight are comparatively smaller with lighter coloured leaves, and bloom well, while those that are exposed to full sunlight are in most cases small with short, stiff, yellow tinted leaves, the flowers being small also.

The flower spikes make their apppearance about the beginning of August, and the flowering season continues until December. This being the dryest period of the year access to the jungle is favourable, and *Phalaenopses* collected and potted at this time establish themselves quickly, and will flower without fail the following year.

Propagation is from seed which germinate in hundreds if dusted on to the compost in which a parent plant is potted, and seed from cross fertilisation germinate just as readily. I have found seedlings doing well on flower spikes that have remained green to support them.*

The foliage of the scrub trees, and the leaves of this Orchid being the one colour, it is no easy matter to locate them, but should a collector be fortunate enough to come across one low down where it is easily seen, a close scrutiny of the surrounding trees will generally reveal more plants.

The diagram by Emile Galiston in the December issue of the Aust. Orchid Review, 1941, p. 85, shows clearly the best method of suspending *Phalaenopses.* This is absolutely necessary to ensure natural looking plants, and it is advisable to have them facing the light at all times, otherwise the leaves and flower spikes will twist around, and a misshapen plant is the result. I am not suggesting ways and means of potting *Phalaenopses,* as I consider these particulars will enable growers to select a suitable compost to fit in with the conditions under which they are to be grown, and at the same time to decide on the correct amount of water and light necessary for their successful growth.

Before concluding I would like to mention that any Orchid enthusiast who makes a second trip in search of *Phalaenopsis* is certainly afflicted with the Orchid mania, as it is not all pleasure climbing the mountain sides through dense tropical jungle among "wait a while" vines, stinging tree, scrub itch, ticks, leeches, death-adders, snakes, and hornets; climbing up and cutting down large trees whose tops are tangled with vines, to say nothing about a stiff neck caused by gazing skyward.

**Phalaenopsis* species also have the habit of producing plantlets or "aerial growths" on the flower stalk.—Hon. Editor.

● Subscriptions for the Australian Orchid Review, 6/- (six shillings), should be posted to Australian Orchid Review, c/o Messrs. Shepherd and Newman Pty. Ltd., Yurong Street, Sydney, N.S.W.

Reminiscences

E. J. BEARD, *Brisbane, Q.*

● My first recollection of Orchids was in rambling through a scrub at Upper Coomera in 1880. This scrub was portion of my employer's property, and was situated below Tambourine Mountain. I lived with Edward Carrington, a fine old British botanist from whom, no doubt, I imbibed his love of flowers. His knowledge of plant life was remarkable and he taught me the art of budding and grafting, how to prune rose and fruit trees and the many things necessary for the horticultural enthusiast. His knowledge of Orchid culture was limited, but he was always keenly interested in the scrub Orchids I brought back from my rambles in the scrubs. English catalogues, also seeds and bulbs, used to arrive regularly, and it was from this source that I must have written to Sutton & Sons, Reading, England, for I have a letter dated 1880, and written with a quill in a bold hand, stating that in reply to my letter regarding Australian Orchids they would respectfully refer me to their agents in Sydney, viz.: Anderson & Co., Sussex Street.

I think the first Orchid I saw in flower was a large clump of *Calanthe veratrifolia,* which appeared to be growing on the ground in a very damp and shady position, in a compost of an accumulation of many years of decayed leaves. When this was carefully removed to an exposed sunny position in our garden the plants soon perished, and we had our first lesson in Orchid growing that taught us the necessity of trying to give the plants as nearly as possible the conditions they enjoyed in their natural state. That lesson has never been forgotten, but it is at times difficult, when new species arrive, to find out whether the particular Orchid grew on a high mountain or in a hot jungle. If one is lucky to have two plants he will probably put one in the glass-house, and the other in his cool-house and closely watch which treatment shows the best result.

It is remarkable that while some varieties are so easy to grow, and flower, others sulk and die despite constant care and attention. The situation, the compost, and the attention given play important parts in the success or otherwise of growing Orchids, yet one is amazed at the opposite results gained from apparently similar conditions. As an illustration let me give a case that recently came under my notice. A very keen grower who we all know well, cannot get *Cypripedium glaucophyllum* to flower, or even to live. With me it is a picture of health, and is nearly always in flower. He has some magnificent plants of *Cypripedium callosum* that are a delight, yet I have tried in vain to get my plant to flower.

One of the greatest and most successful growers Australia ever had, was the late Otto Bartels, but he could not make a success of *Vanda coerulea.* I could always do fairly well with it. He tried my system, but it wouldn't work. We then imported, on a 50-50 basis, one hundred plants of *Vanda coerulea.* The first year both lots gave a fine display of blooms, but in about two years, Otto Bartel's fifty had diminished to four or five, while I still had about thirty, and a couple of plants lived to flower twenty odd years later, when they died.

Vanda teres gave me an experience that has proved valuable. I grew it in a shaded bush-house. It grew splendidly but never flowered. Eventually it penetrated the battened roof, got into the sun, and then gave a wonderful display of flowers. I always grow it out in the sun, summer and winter, now, and it always flowers. The terete Vandas all like this treatment.

Over fifty years ago a doctor was examining me for life insurance and advised me to adopt some hobby. He said I had a very active brain and needed something to take my mind off the many office worries that seem to be inseparable from a commercial post that carries any responsibility. He asked me if I knew anything about Orchids, and when I said I had a few, he advised me to extend the hobby as it would benefit my health. I took the medico's advice, and have never had occasion to regret it.

And so, when I take up my pen to put on paper a few jottings of my experiences, let me firstly say that when the Orchid "bug" bites, it does so deeply, and inculcates a most keen interest in this absorbing hobby. Secondly, let me add with all modesty, that although I may be one of the oldest growers in Australia, I have still a lot to learn about these fascinating and beautiful plants. My remarks, therefore, are intended more for beginners than for experienced growers, and if any of the latter consider my advice different to what their own experience may suggest, I would say that all my experience as a grower has been gained in Brisbane, and this must be taken into consideration.

Had I been in North Queensland or in one of the southern States, my successes or failures would, no doubt, have been quite different owing to the disparity in temperatures at the different centres named. I have seen many of the best collections and have been impressed with the various methods of potting, composts, light and moisture given, and comparing them with my own, have I think, rightly concluded that what would suit some of the kinds in Melbourne would not do at, say, Townsville.

In giving advice to beginners, therefore, one cannot speak generally on the Orchid tribe and advise on any one method of culture, one potting material, or one situation for the successful growing of all Orchids. Their habits in their native state are so diverse that what potting material may suit one variety may be quite unsuitable for another. The same remarks apply to the mode of culture, and the situation given. One's intelligence will convey that an Orchid growing naturally in a shady position at an altitude of ten thousand feet will not thrive in a glass-house with the thermometer registering, say, 90 degrees F. Similarly an Orchid growing on a tree in the tropics, and exposed to the sun's rays would not live long in a shady green-house where the temperature dropped to, say, 30 degrees F. in winter. A little thought, therefore, is necessary before importing or buying Orchids, and I would suggest that buyers should ascertain what varieties are suitable for the respective localities where the growers intend to cultivate them.

A grower living at Tambourine Mountain, or Toowoomba, would very probably have a greater measure of success with some of the cool-house varieties than a grower in Brisbane, and reversely would lose in winter many of the warm house species that will withstand the milder winter in, say, Brisbane.

A beginner should profit by the experiences of others in beginning to assemble a collection. He or she may admire some newly imported Burmese *Dendrobiums* in bloom, such as *Wardianum, Falconeri, and Devonianum,* which are really very beautiful, and may decide to import some, meeting with the same disappointment older growers suffered in losing the plants after one or two seasons. A few years ago an enthusiast showed me with pardonable pride a magnificent plant of *D. Wardianum* with pseudobulbs 5 feet high. It was in full bloom and a very fine sight. He scouted my suggestion that it would be in the graveyard in a couple of years, *but it was.*

A few years ago I visited Ceylon and saw on one of the high mountains above Kandy several plants of *Dendrobium aureum* in full flower. The altitude was above seven thousand feet, and it was very cold. That experience taught me why our summer invariably kills *Dendrobium aureum.*

The late Arthur Yates brought to Australia some years ago several plants of *Epidendrum Boundii* and *E. O'Brienianum.* He placed them in one of his seven hot houses, but as they were not doing well he asked me to try a couple of plants of each variety, as he thought the Brisbane climate might suit them. They grew capitally with me, but until I placed a few aerial growths in the ground in the sun in my garden I did not realise the wealth of growth they give.

From those two small plants have come the many *Ehidendrums* to be seen in Queensland and New South Wales gardens. They increase rapidly and I have given away many hundreds of plants since I discovered how to grow them.

To a beginner I would say, when potting your newly imported Orchid, see that the pot is clean. Then place a flat piece of broken pot over the hole at the bottom. Then fill about two inches with broken crocks, preferably on their ends to ensure good drainage, place a layer of fibre or sphagnum over this drainage, place a stick alongside the plant you are potting and then commence to fill in the potting material, taking care not to injure any of the roots of the plant, pack fairly tight and see that the eye of the plant (from which the new growth will start) is not covered by the potting material. Tie the pseudobulbs to the upright stake to keep the plant from moving.

That is roughly the procedure in potting of epiphytes such as *Cattleyas, Vandas, Dendrobiums, Laelias* and the like.

Composts. I find that for epiphytes the best potting material is something like this:

(1) Good drainage.
(2) Equal quantities of Osmunda fibre, Todea fibre, or if these are not available, Haresfoot or Staghorn peat.
(3) A sprinkling of crushed old cow manure or sheep droppings and a small quantity of charcoal and bone meal.
(4) Clip all ragged ends of fibre and make neat.
(5) Top dress with a small quantity of sphagnum moss.

The compost for terrestrial Orchids, such as *Cypripediums,* should be varied by the inclusion of about one-third of good leaf mould.

The finest education in Orchid growing can be obtained at little cost by joining an Orchid Society, which is ever willing to give advice.

The Genus Dendrobium in New Guinea and the Solomon Islands

C. T. WHITE, *Govt. Botanist, Brisbane, Q.*

● New Guinea, the world's second largest island, has an area of 327,250 square miles, which is only exceeded by Greenland with an area over twice the size, though Borneo and Madagascar approach New Guinea fairly closely. New Guinea differs from the nearest large land mass, Australia, in the fact that the mountains rise to a considerable height, culminating in Mt. Carstenz in Dutch New Guinea, attaining a height of 15,964 feet. The interior of the island and practically all the northern part is covered with dense rain forest, mostly mountainous and rising from sea level to 6,000 feet. This is an ideal development for epiphytic Orchids. The southern coast of New Guinea consists largely of open Savannah forest in which Eucalypts predominate, and large areas are covered with fresh water swamps in which Sago Palms and Breadfruit are the predominating trees. These forests are not as rich in epiphytic Orchids as the rain forest but contain some distinctive types. It is generally conceded by botanists who have made a specialty of Orchids that New Guinea possesses the densest Orchid flora of the world, over 1,600 species having been described. Of this number, nearly 600 are Dendrobes. This complexity of forms makes the group a very difficult one for other than the specialist to follow.

Bougainville Island, though part of the Mandated Territory of New Guinea, is geographically perhaps more a section of the Solomon Islands. It is largely covered with rain forest and has a central mountain chain to 10,000 feet high. The southern end of the island ends in a large plain. The Orchids have not been very much studied. The Solomon Islands proper contain large areas of rain forest, though big plains of Kangaroo Grass (*Themeda*) occur, and these, according to local observers are advancing due to the regular firing by natives for hunting. The mountains of the Solomon Islands are lower than those of New Guinea, or Bougainville, but the country has not been extensively collected over for Orchids. Some collections made by recent botanists, such as Brass and Kajewski, have not yet been examined.

The Santa Cruz group, which lies between the Solomons and New Hebrides consists of several small islands of which Vanikoro is the principal. The rain forest is very dense and a Kauri Pine (*Agathis*) is the predominating species. S. F. Kajewski botanised here extensively in 1928-29, and his Orchids have been described by Ames and Schweinfurth in Volume 13 of the Journal of the Arnold Aboretum. Politically the country is divided into three separate sections, namely, the Dutch, the Mandated Territory, and the Territory of Papua. The Mandated Territory was formerly known as German New Guinea, the mainland as Kaiser Wilhelm's Land, and the islands as the Bismarck Archipelago. The Territory of Papua was previously known as British New Guinea. The Dutch territory occupies approximately half of the island, and its Orchids have been extensively studied by the Dutch Botanist, J. J. Smith. For many years he was Curator of the Herbarium at the famous Botanic Gardens at Buitenzorg, in Java. The Orchids of the Mandated Territory have been described by the various botanists, but mainly by Rudolph Schlechter, who visited the country in 1901-2 and again for a longer period in 1906-9. His visits were mainly connected with economic botany, especially with wild rubber-producing plants, but though he wrote extensively on many plants, his main love, I think, was Orchids. Smith confined his work more or less to the Dutch East Indies, and New Guinea, but Schletcher, in addition to writing a big work on the Orchids of the then German New Guinea, published monographs of the Orchids of Central America and Northern South America, Africa, and Europe. He was also editor of the publication, "Orchids." In comparison with the other two territories, the Orchids of Papua are very imperfectly known. Our knowledge of them is due to Baron von Mueller, to F. M. Bailey, and more recently to the late Dr. R. S. Rogers, of Adelaide, South Australia.

Before I started to prepare this paper I had not realised that the Orchid flora of New Guinea was so rich, and the genus *Dendrobium*, in particular, so strongly represented. It was my first intention to prepare a list somewhat similar to the descriptive list I gave of Australian Dendrobes recently in the Australian Orchid Review, Vol. 7, Part 1. After having prepared two or three hundred slips I found the task was quite impracticable, and decided to merely pick out some of the showy and better known types. To facilitate the study of the large genus *Dendrobium* it has been divided into a number of subgenera and sections. A section well represented in New Guinea is one of which our common Bottle-brush Orchid (*Dendrobium Smilliae*) may be taken as the type. The following are some members:—

D. coelandria. The flowers are described as scarlet and borne in a shorter and fewer-flowered raceme than *Smilliae. D. ophioglossum,* is illustrated and described in the June number of the A.O.R. *D. Smilliae* is represented by the variety *Hollrungii.* The flowers are somewhat larger and not tinged with purple.

A section well represented in New Guinea is that containing the Antelope Orchids, characterised by the upright, slightly twisted petals resembling the horns of an antelope. *Dendrobium D'Albertisii* is one of the best known. The flowers are white, the petals narrow, about twice as long as the dorsal sepal and much twisted. *D. Grantii* is very closely allied. The flowers are white and about 22 in a raceme. It is described and figured in the A.O.R. for September, 1940. *D. stratiotes* is one of the most beautiful of the section. The flowers are white, often suffused with green, the labellum rose veined and spotted. It is a native of the Sunda Islands and is much cultivated in the East, and has been doubtfully recorded from New Guinea. There is a good illustration in the A.O.R. for December, 1938. *D. leporinum* has petals not more than 1½ times longer than the sepals. They are scarcely twisted but very much narrower than the sepals. *D. undulatum* can be taken as the type of a small group in which the petals and sepals are similar, and both twisted. *D. Mirbellianum* is the type of a group well represented in New Guinea in which the petals are markedly narrower than the sepals and spathulate in the upper portion. According to J. J. Smith is has bright green flowers. *D. macranthum, imperatrix* and *robustum* are notable examples of this group. *D. Gouldii* has scented flowers, the sepals somewhat larger than the petals, both are white in the lower, and lemon yellow in the upper part. The labellum is pale yellow with three crested violet lines in the upper part. *D. trilamellatum, Odoardi* and *arachnostrachyum* are allied species. The *superbiens, bigibbum, Phalaenopsis group* is well represented in New Guinea. The best known and greatest favourite with Orchid growers is *Schroderianum,* regarded as a variety of *D. Phalaenopsis.* It is frequently seen at the Q.O.S. meetings. A good illustration appeared in the A.O.R. for September, 1941. Closely allied, though superficially very distinct is a section of which *atroviolaceum* can be taken as the type. It is apparently fairly common in New Guinea for it is frequently seen in cultivation in Queensland. The flowers are pale yellow, darkly spotted, the labellum dark violet. An excellent illustration of the whole plant is given in the A.O.R. for June, 1938. *D. macrophyllum* is an Orchid I have received once or twice from New Guinea. The flowers are a rather pale yellowish green, the labellum is widely spread, and marked with dark transverse lines inside, and dots on the outside. The chief characteristic of this species is the hairy nature of the sepals and flower stalks. *D spectabile* is one of this group with rather remarkably coloured flowers; the sepals yellow streaked with pale red lines; the lower part of the labellum white with violet lines.

Of the 600 odd Dendrobes of New Guinea only a few outstanding ones have been picked out, and readers no doubt may call to mind some others they think should have been included. For the most part, the Dendrobes are rather insignificant. It is strange that so many endemic species of Orchids should have been found in New Guinea, and that of these endemic types more than one third should belong to the genus *Dendrobium.* The closely allied genus, *Bulbophyllum,* also probably contains about 500 species, so these two genera between them occupy more than half the Orchid flora of New Guinea. Nine endemic genera have been recorded from New Guinea, but most of these are monotypic, i.e. consisting of a single species. From its richness and the degree of endemism, that is not found elsewhere, the late Dr. R. S. Rogers, for many years Australia's leading orchidologist, considered that the Orchids of New Guinea are in an active state of evolution and dissemination. He estimated that the Orchid flora originated from the East, but has been developed for a sufficiently long period to permit of the development of a high degree of endemism. What Dr. Rogers says of the Orchids applies to the flora of that island as a whole.

● Editorial matter, M.SS., and photographs should be sent direct to P. A. Gilbert, Hon. Editor, *The Australian Orchid Review,* 37 Colin Street, Lakemba, New South Wales.

● Address communications regarding The Orchid Society of New South Wales to Mr. T. H. James, Hon. Secretary, Valley Road, Hazelbrook, N.S.W.

● At the Ninth Annual General Meeting of the Orchid Society of New South Wales, held on Thursday, August 26, 1943, the following officers and committee were elected for the year 1943-44:—

President, E. A. Hamilton; Vice-Presidents, C. C. Hildebrandt, Dr. J. A. Vote; Hon. Secretary, T. H. James; Hon. Treasurer, G. J C. Tosi; Hon. Editor (A.O.R.), P. A. Gilbert; Committee, J. Bisset, C. Cambourn, F. Douglas, W. Fahey, L. F. Hawley, W. Palmer, W. Worth.

● ***Prasophyllum:*** Seven new species. Obviously the Rev. H. M. R. Rupp had been working overtime to describe this bunch of *Prasophylls*, the descriptions appearing in the "Victorian Naturalist" for November, and December, 1942, and January, 1943, under the caption "The Section *Genoplesium* in the Genus *Prasophyllum* (Orchidaceae)." The new species are:—*P. Elmae, P. Nichollsianum, P. Horburyanum, P. unicum, P. sagittiferum, P. Wilsoniense, P. plumosum.*

● ***Library.***—The books of the Society which are kept within the Public Library of Queensland, William St., Brisbane, are in perfect order and condition. They are available to every financial member to read during library hours. This collection of valuable books is a big asset to the Society, and is of great assistance to the student of Orchid culture.—Extract from the Q.O.S. Annual Report, December, 1942.

● *Oncidium, varicosum, var. Rogersii.*—Mr. C. Cambourn grows these plants out-of-doors with *Cypripediums* under a skillion glass roof, with three sides of the house completely open. They are well protected, however, on the south and west. The species, native of Brazil, is quite easily grown when potted in broken crocks and any of the various fibres. It also grows very well on a block of fibre, or placed well down between the shields of a growing staghorn fern. One of the showiest of the *Oncidiums*, it is a brilliant yellow. The plant shown carried about 60 fine blooms on a 4 feet wiry stem, and had been in flower over five weeks. If grown in a heated house it has a decided tendency to make false growth, and does not flower. Sprayed twice a day in the growing period, it demands very little water in winter. *Rogersii* varies very much both in size and shape, but all are good. It adds a brightness to the house in late summer when there is little else out. Exhibited at the March meeting of the Orchid Society of N.S.W. —W. Worth, 27/3/43.

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AUSTRALIAN ORCHID REVIEW

Volume 9 MARCH, 1944 No. 1

The author of each article is responsible for the facts and opinions expressed therein.

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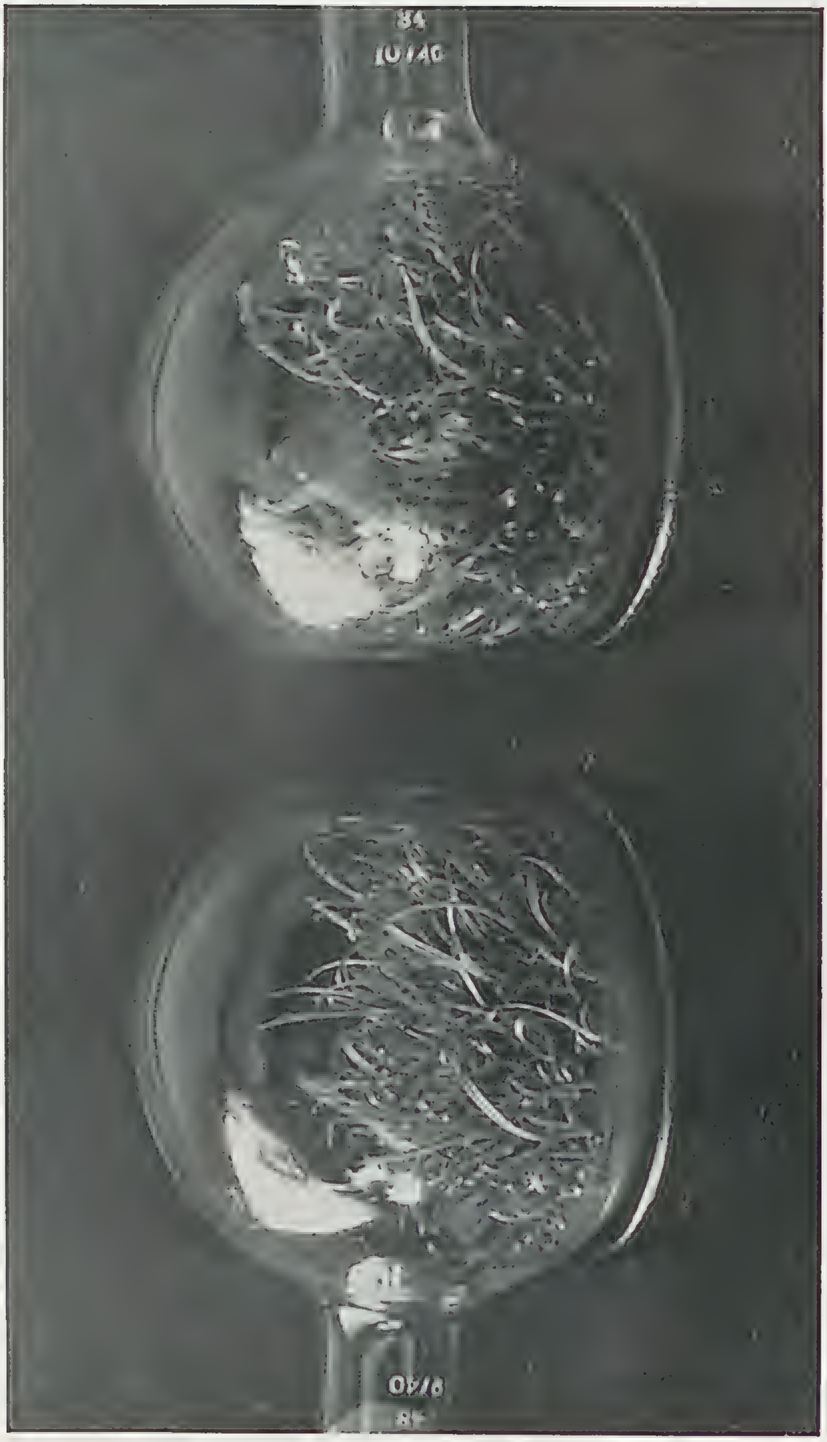


Cymbidium Seedlings in 1000 c.c. flasks on agar-agar medium. The flasks are 5 inches in diameter. Seed sown September, 1940. Photographed December, 1941. Grown by C. Cambourn and A. B. Porter. Photo by A. B. Porter.

Raising Orchids from Seed

C. CAMBOURN and A. B. PORTER

● When any seed germinates, the young seedling must be maintained until it has developed sufficient root system to supply itself with necessary water and mineral salts, and sufficient leaf chlorophyll to manufacture its own sugar and starch from the atmosphere.

Most seeds contain a reserve stock of food to support the developing seedling until it can fend for itself, but the Orchid seed is a germ only, with no food reserves to tide it over the first stages of its development. It must be fed with all the substances it requires for its growth from the commencement of germination, and this is why special technique is necessary for the successful raising of Orchids from seed.

In nature only a small number of new plants need be produced in order to maintain the various Orchid species, because, barring accidents, an Orchid plant lives almost indefinitely, subject to the life-span of the tree on which it is growing. In many species, some of the new plants required are provided by aerial growths.

However, Orchids produce vast numbers of seed, up to a million in a single pod, so it is only necessary for a very small proportion of the seed to fall in places where all the conditions are right for its germination, and there produce new plants, but when man takes a hand in the matter, he is not satisfied with this small proportion, and from the earliest days of Orchid culture many attempts have been made to germinate a high proportion of Orchid seed.

The first successes were obtained by planting the seed on the surface of the compost of parent plants, and seedlings can be obtained by this method, the principal disadvantages being irregularity of results, and the fact that conditions of temperature and humidity, which suit the seedlings best, are not favourable to the adult plants.

In 1909 Bernard in France and Burgeff in Germany began publishing results of their experiments on germination, both having isolated certain types of fungi from Orchid roots and used cultures of one of these fungi to germinate seed. The fungus actually grows into the seed, when it first swells by absorption of moisture, and a *mutual aid society* is set up. The fungus provides the seedling with food materials obtained from the surrounding compost, and at the same time benefits from by-products of the young Orchid's growth. This state of affairs is known as *symbiosis.*

The usual method of growing seedlings by the fungus method is to sterilize fibre in a flask, inoculate it with the right fungus, and then sow the seed when the fungus has grown through the fibre. The method has been used commercially but has certain disadvantages, the main one being that the fungus obtained from one genus of Orchid is usually not satisfactory for the seed of other genera, and each culture of fungus must be tested with each batch of seed to make sure that it will germinate it.

Seedlings have also been raised in quantity by filling pots with fibre, covering with a piece of towelling, and sowing the seed on the towelling. If kept constantly damp the seed will germinate and continue to grow, but results are not nearly as reliable as those obtained by the modern method.

A great many seedlings have been raised in this way, and prior to the introduction of the sterile method it was used commercially to a considerable extent.

The first artificially raised Orchid to flower was produced by Mr. J. Dominy, an employee of the Orchid firm of Messrs. Veitch. It was a *Calanthe* obtained by crossing *C. furcata* with *C. masuca,* and flowered in 1856. Several other growers began hybridising soon afterwards, and gradually hybrids of the various well-known genera appeared. The years of flowering of the first hybrids in several genera are: *Cattleya,* 1859; *Laelio-cattleya,* 1863; *Cypripedium* (*Harrisianum*), 1869; *Dendrobium* (*Ainsworthii*), 1874; *Cymbidium* (*eburneo-Lowianum*), 1889.

In 1922 Dr. Knudson published a paper in the Botanical Gazette expressing the belief that Orchid seed could be germinated successfully without the aid of fungus provided the necessary mineral salts were supplied plus sufficient sugar to take the place of carbohydrates stored in the seed of other plants. He proved the truth of his theory by successfully raising seedlings under sterile conditions and this work is the basis of present-day methods.

When Knudson first produced seedlings without fungus, sceptics claimed that although his plants grew they would never flower. He effectively disposed of this idea by growing a *Cattleya* right to flowering under sterile conditions in a large flask.

Before proceeding to the raising of seedlings one should first understand the method of fertilizing flowers and obtaining the seed.

Cymbidium Seedlings. Seed sown on agar-agar medium, September, 1942. Transplanted to fibre in pots September, 1943. Photographed November, 1943. The pots are 2ins. and 2½ins.

Grown by C. Cambourn and A. B. Porter. Photo by A. B. Porter.

The pollen of an Orchid is situated at the top of the *column* inside the flower and covered by a removable cap. A little below this on the front surface of the column is an area containing a sticky substance somewhat like soft glucose in texture. This is the stigma of the flower and it is here that the pollen must be placed in order to produce a seed-pod. Between the pollen cap and the stigma is a pointed projection rather like a beak, known as the *rostellum.* In order to fertilize a flower, remove the pollen from the flower selected as pollen parent by placing a sterilized needle or sharpened and charred match under the rostellum and pushing up the pollen cap, when the pollen grains will stick to the needle by means of the sticky discs attached to them. Without allowing the pollen masses to touch anything, and without unnecessary delay place the pollen firmly on the stigma of the flower which is to be the seed parent.

Each waxy-looking pollen mass actually consists of a vast number of tiny pollen grains and when placed in the sticky fluid of the stigma, each grain sends out a very fine tube which grows down through the column to the *ovary* situated below the flower and looking like a fluted portion of the stem.

While this is happening the column swells to several times its former size, and the ovary begins to develop into a seed pod, but actual fertilization does not occur until the pollen tubes penetrate the *ovules* or embryonic seeds in the developing pod. This may not occur for a month or more after the flower is pollinated, and if for some reason the pollen tubes do not successfully fertilize the ovules, the pod will either turn yellow and drop off, or continue its development but produce no seed.

When it is desired to cross two species or hybrids which flower at different times, the pollen from the one which flowers first must be stored until the later one flowers. This is done by removing the pollen in the usual way, wrapping it in tissue paper and storing in a tightly sealed bottle at a temperature of 46°F. until the second flower is ready to be fertilized. The pollen is then placed on the stigma in the usual way.

When two complex hybrids are crossed, it will frequently be found that the resulting pod contains only a small proportion of fertile seed.

When the time is approaching for the pod to open, it is a good plan to slip a cellophane bag over it, fixed loosely in position so that if the pod begins to shed seed it will not be wasted. Do not tie the bag tightly but allow air to circulate, otherwise damp condition in the bag will encourage the development of fungus. As soon as the pod begins to split, and seed it seen in the bag, pick the pod and leave it in a dry place for a few days. The seed can then be shaken from the pod, and should be wrapped in tissue paper for several days before being stored in a corked tube.

Orchid seed remains good for a period depending on the type of Orchid, and the conditions of storage, but if kept in a dry atmosphere at a low temperature will remain good for several years. Knudson recommends storing in a refrigerator at 46°F. in a sealed jar containing calcium chloride to keep the enclosed air dry.

Numerous formulae have been used by different workers for the preparation of germinating media, but the method is much the same for all of them, and Knudson's formula will be taken as an example. The following solution is prepared, each substance being completely dissolved before adding the next in the order given:

Calcium Nitrate, $Ca(NO_3)_2 .4H_2O$	1.0 gram
Potassium Phosphate, K_2HPO_4	0.25 ,,
Magnesium Sulphate, $MgSO_4 .7H_2O$	0.25 ,,
Ferric Phosphate, $FePO_4$	0.05 ,,
Ammonium Sulphate, $(NH_4)_2SO_4$	0.50 ,,
Distilled water	1 litre

To this is added 20 grams of cane sugar and 15 grams of agar, and the mixture is then heated till the agar dissolves.

The purpose of the agar is to set the solution into a jelly on the surface of which the seed rests while germinating. It is interesting to note for the benefit of fertilizer enthusiasts that the total concentration of salts is equivalent to only 2lb. per 100 gallons of solution.

As soon as the agar is completely dissolved the acidity of the solution is adjusted by addition of Hydrochloric Acid to give a *pH of* 4.9—5.0 after sterilization. It is not sufficient to adjust to the right *pH* at once, as the acidity will change during sterilization to an extent which varies with different samples of agar. It is necessary to find out how much acid to add before sterilizing to give the right final *pH*, and this is best done by trial on a sample. Another method is to keep the solution boiling and add small quantities of dilute acid till the *pH* remains steady at the right value when it will be found to vary very little in the sterilizer.

The medium can now be put into the flasks which are to be used for germination, conical flasks of about 250 c.c. capacity being a handy type. They should be of good quality glass, preferably Pyrex. About 80 c.c. of medium is sufficient for a flask of this size. Each flask is fitted with a neatly fitting rolled plug of cotton wool to keep out bacteria and fungi, and they are then ready for sterilization. If an autoclave is available, 30 minutes at 10lb. pressure should be given, but one hour in a current of steam without pressure is quite satisfactory. A steamer with perforated bottom fitted to the top of a saucepan serves quite well provided the top is covered.

After sterilizing, the *pH* is checked and the flasks stood aside to cool, either standing upright or leaning on a suitable support, to allow the medium to set in a sloped position. The latter method makes seed planting rather easier. When the medium is cold and has set into a jelly, the flasks are ready to receive the seed.

The seed must be sterilized before being planted, otherwise spores of destructive fungi are sure to be put into the flasks with the seed, and failure will result. Of course seed must not be sterilized by heat or it would be useless, so a solution of bleaching powder, otherwise known as chloride of lime, is used. Do not confuse this with calcium chloride, a totally different substance.

10 gms. of bleaching powder are shaken with 140 c.c. of water, allowed to settle and filtered. The seed is shaken up with the resulting clear liquid for 15 minutes in a small corked tube and after allowing to settle, cork downwards, for a few minutes, the liquid can be carefully run off, leaving the seed adhering to the sides of the tube. All is now ready to begin planting.

The tool used for planting the seed is a fine wire of platinum or steel will do, mounted in a suitable holder and with a loop at the end. With the aid of the loop, a quantity of seed is gathered from the inside of the small tube, the cotton wool plug is removed from the flask, and the seed placed in the liquid which will always be found at the edges of the medium in the flask. The neck of the flask is quickly passed two or three times through the flame of a bunsen burner or gas ring, to kill any spores which may have fallen on it, then the surface of the cotton wool plug is set on fire for the same reason, and the plug restored to the neck of the flask.

By moving the flask about, the liquid containing the seed is made to flow over the surface of the medium distributing the seed as it goes.

Each flask should be clearly labelled either with the actual cross or a distinguishing number referring to a record of the cross, and also the date of planting.

Unless some precautions are taken, water vapour will gradually escape through the cotton wool plug of the flask and the drying up of the medium will check the growth of the seedlings before they are big enough to transplant. Knudson recommends a glass beaker or similar vessel placed over the neck of the flask covering the plug, and resting on the conical sides of the flask. Probably the most effective method is to seal with waxed paper. To do this the plug is trimmed level with the neck of the flask, singed in a flame, and then pushed down about half an inch into the neck. A piece of cotton wool which has been soaked in Mercuric Chloride solution and dried is put over the neck and then waxed paper tied over this while the neck of the flask is still hot.

During the germinating period, the flasks should be kept at a temperature of about 70°F. and given a reasonable amount of light but not direct sunlight. The seed gradually swells to a transparent jelly-like mass like a small grain of cooked sago, which later turns green and after several months the first leaf appears from the top. At the end of nine to twelve months the seedlings should have two or three leaves, and one or more roots, and are then ready for removal from the flasks to small pots.

When the seedlings have reached this stage they are shaken from the flasks or picked off the medium with a slender pair of tweezers, and must be immersed in water to remove any adhering medium. Small pots, about 2 or 2½ inch, are crocked and filled with very finely chopped fibre, preferably osmunda, and the seedlings planted each in a hole made with a pointed stick in the surface of the fibre. From five to thirty seedlings may be planted in each pot according to the size of the plants. The size of the seedlings will be found to vary considerably, and as far as possible, plants of similar size should be put in the same pot.

A hot moist atmosphere is necessary for the growth of the young plants after potting, and this is obtained by keeping the pots in a glass case in the bottom of which is a tank of heated water thermostatically controlled to maintain a temperature of 75°F. in the case.

The case is opened to admit air for increasing periods as the seedlings grow, and as the size of the plants demands, they must be repotted, placing a smaller number in each pot to avoid overcrowding. Constant attention is necessary to avoid drying out, and a fine spray should be used to keep the compost damp and the atmosphere humid.

Attacks by insect pests will cause serious setbacks to young Orchids, and if any sign of the pests appears, spraying with a nicotine spray is recommended.

After being in the case for twelve months the plants should be large enough to be potted individually into 2-inch pots, and transferred to the glass-house where they must still be guarded against drying out, and the attack of pests.

If all goes well at every stage, the most advanced plants should begin to flower in five to six years from seed, although some kinds, particularly *Phalaenopsis* flower much more quickly in favourable conditions.

It cannot be too strongly stressed that it is sheer waste of time to attempt to raise Orchids from seed unless the seed has been obtained from first-class parents. The raising requires a great deal of time and effort plus endless patience, and to begin with seed obtained from parents of mediocre quality will inevitably result in disappointment when the long-awaited flowering time arrives, and it is found that only third-rate types have been produced. Colour, form, and size of flowers, freedom of growth and flowering, and the season at which the plants flower, should all be considered when selecting plants for crossing, and at all times remember that only the very best is good enough to use for hybridization.

- Back numbers of the Australian Orchid Review are still available, excepting four issues, which are Vol. 1, No. 3; Vol. 2, No. 1; Vol. 3, No. 3; Vol. 4, No. 3, whilst there are only a very small number of Vol. 1, No. 2 and Vol. 4, No. 2. Copies of Vols. 1 and 2 are priced at two shillings each, Vol. 3 one shilling and ninepence each, and all subsequent issues one shilling and sixpence each.

- Editorial matter, M.SS., and photographs should be sent direct to P. A. Gilbert, Hon. Editor, *The Australian Orchid Review*, 37 Colin Street, Lakemba, New South Wales.

A Talk on Hybrids and Their Production

W. F. ADAMSON, *Bulimba, Q.*

● A hybrid is the product of the union of two distinct species. This definition applies to all things which live and breathe. For instance, when we see an animal which exhibits a mixed line of breed, we pass it off just as a mongrel. Without a doubt it is a mongrel, and at the same time a hybrid. Its line of breed is not controlled and guided in any respect other than by the urge and laws of Nature. It is a natural hybrid.

If the animal's parentage had been chosen and controlled along any definite line it would have been an artificial hybrid, but nevertheless it is still a mongrel. We have human hybrids which we are pleased to call cross-breeds. Human hybrids are comparable to the illustration I have given you above. Our code of laws has made them social outcasts. They are not common, and can be regarded as stray natural hybrids of no fixed type. Perhaps environment plays a big part in the production of these unfortunates. Where races of humans, through force of arms and mass invasion, have forced their blood upon other people of a different race, and stayed in their adopted country, a fixed type has been evolved. We could call the progeny of these races artificial hybrids because of the imposed and direct line of breeding. The foregoing examples should enable you to understand what a hybrid is and to differentiate between natural and artificial hybrids.

Plant breeding is affected and comparable to the explanations I have given you, excepting that we view the hybrid from an entirely different angle. We are not concerned whether it is artificial or natural, as long as it exhibits something more attractive or desirable than its parents. Natural hybridization has been going on and will go on right through the ages. Artificial hybridization has created wonderful things for mankind. I am afraid that many of us fail to understand, or recognise, the vast field the hybridist has covered.

Fodder plants and animals have been evolved to withstand harsh and unfamiliar climatic conditions. That line of breeding has made it possible for the human race to live and prosper in places where otherwise life would have been a hardship. The hybridist is constantly working to improve the carrying capacity of our pastures by breeding plants of better quality, and heavier yield per acre. We breed animals for a similar set of reasons. Cattle for production of milk, cheese, butter, or beef. We may cross sheep for better quality mutton or larger yield. Then again the breeder may be working for heavier wool, longer or finer staple. Have you ever studied the origin of the cereals and food plants, which we are totally dependent upon? If you have, you will realise that the hybridist has achieved wonders. He has improved our standards of living, and added to our means of life, luxury, and comfort.

Many people seem to regard hybridization as something secret and intricate. They think that special knowledge is required to practise this art; Nothing is farther from the fact. A knowledge of Botany though helpful, is not essential. Special requirements of a successful hybridizer and breeder, are reasonable intelligence, patience, unbounded enthusiasm, and love for his plants, imaginative and creative ideas. Pollination either naturally or artificially is a simple sex matter in plants as it is in other things. All forms of life have a natural duty to perform, the reproduction of their kind. Maturity and natural healthy vigor bring about this desire to reproduce their kind. It is a law of nature and must be fulfilled. In plants the product is a fruit or seed pod, many of them are edible and very necessary to our daily life. What an interesting story could be told, of the ways and means Nature provides and employs, to distribute the contents of these seed pods, over the surface. Nature tempts man and beast to accept them as food, to carry them, store them, eat them, and spread them. Some are very light, others are winged, so that the wind may be employed to carry them. Others have mechanical features in the construction of the fruits which distribute the seed. There are some that are buoyant and float along with the tides of rivers and the waves of the ocean. I leave these things to your own imagination. I have said that pollination is a simple matter, but it is not so simple to produce fertile seed pods. Plants that do not possess good healthy roots will not produce fertile seed pods. They would be incapable of sustaining themselves, in the vigorous condition required to enable them to carry the seed pod to maturity.

Plants that are excessively and artificially manured will produce barren pods. If the flowers to be used in effecting the cross are over or under matured barren pods will result. I believe that even the time of the day when the operation is carried out affects the fertility of the seeed. This may be more the case with the female organ. Orchids which emit their perfume at night should only be pollinated or cross-pollinated during that period, as it appears to me that such flowers may not be in a receptive condition at any other time. On the other hand, I see no reason why the pollen from the male organ of such a flower could not be used to advantage on a flower which is receptive, in strong sunlight. Nearly all of these night scented Orchids are devoid of attractive colour, they are usually white, cream or green. They all possess an alluring perfume which attracts the pollinating agent, usually a moth. Almost all the highly coloured and often scentless Orchids should be pollinated or crossed during the hours of strong sunlight. Only examination and experience will guide you as to when the pollen is in a proper condition for use.

If the stigmatic surface in the flower is in a healthy, receptive condition, and the pollen used in the cross is either over or under matured you you will probably produce a pod but it will be quite barren. Success depends on the receptive condition of the female organ, and the corresponding healthy and mature condition of the pollen from the male. Pollen from most Orchids should be of a rich cheese-like colour and not hard to the touch. *Cypripedium* pollen should be a rich brown colour, and very pasty to the touch. In fact it is sticky and should spread over the staminode like treacle. I must admit that it took me two years to find out why my *Cypripedium* pods were always a failure. After the first season's failure I blamed the atmosphere of the glass-house. After the second failure I reasoned that as my plants were all in perfect health, there could be nothing wrong with the atmosphere. I experimented with the next batch of flowers and found the trouble. *Cypripediums* are very long-lasting, and I had been trying to cross-pollinate the flowers when they were only one or two weeks old. I studied the changes taking place in the pollen as the flowers aged. I noticed that it expanded, became a richer colour, and very sticky. I applied the lesson I had learned, and was rewarded with success. I do not propose to go into any botanical detail ,but would advise anyone desiring botanical knowledge of Orchids to read carefully articles written for the Australian Orchid Review, Vol. 1 and 2, by L. F. Hewley. Also that very interesting lecture, entitled *Sex in Orchids*, by Dr. D. A. Herbert, A.O.R., Vol. 6, No. 3. Dr. Herbert has explained in very simple language, the construction of a flower and what takes place within the organs when a cross is effected. For those who fail to understand I would suggest that they take a razor blade, cut away the sepals and petals of a flower, so as to expose the sex organs to full view.

After examination and noting the position of the male and female organs you should understand how to effect pollination or cross-pollination between two flowers. Natural pollination and cross-pollination are only a local affair with Nature working the conveniences and material at hand. It is limited to the surrounding locality. The insects which perform this very necessary work are not conscious of the fact. They must eat to survive, and that is their only concern in the flowers they visit. Artificial pollination and cross-pollination is a controlled and ordered art with an unlimited range. Of course, artificial cross-pollination could be just as haphazard as the insects' work. To avoid this we should work along definite lines. Any of the following characteristics may influence us. Size and boldness, beauty of form, brilliant or delicate colour, prolific blooming, perfume, long life of blooms, early or late blooms, vigorous growth. Imagination and thought play a big part here. Your decision may produce something startling, vivid and beautiful. On the other hand you may get something quite inferior.

When we make a cross we should always select plants that are known to be good breeders. Commoner varieties are always easy to breed from. We should select plants that have outstanding qualities. One line of breeding that would be worth following would be selection of outstanding types among species and crossing between themselves. From time to time one sees outstanding plants among our own native *Dendrobiums*, such as *superbiens*, *undulatum*, *phalaenopsis*, and *bigibbum*. Outstanding plants from these could be made to breed the selected *selfs* I speak of. Some may say the progeny would still be the species we started with. Quite so, but only in name. The selected and ordered line of breeding would improve them to such an extent that we would hardly recognise them, as having sprung from the common stock.

The hybridist and breeder has done this with almost all our garden flowers. Look back at the straggly, puny ancestors of the beautiful modern gladioli and dahlias. Those things take time, especially with Orchids, but the objective is worth while. Hybridists are constantly working to improve the shape of Orchids. Some wonderful examples of this can be seen in the modern

Cypripedium. We have also better shape produced in some of the latest *Cattleya* hybrids. There has also been a very pronounced improvement in *Cymbidium* hybrids. When a flower is cross-pollinated always make a point of describing the cross the date on which it was carried out, and label. It is wise to cross a number of flowers of the same thing, because if you depend on one you may fail. You will need infinite patience while you wait for the seed pods to ripen. I have seen *Epidendrum* flowers self-pollinated by a small wasp, develop and ripen in a few months. Most Orchids take 12 months, or a full season, to develop and ripen their seed pods. The pods are generally ready to shed their seed when the next season's flowers open. Premature ripening of seed pods is a bad sign, they are seldom any good. Seasonable and climatic fluctuations very often ruin the seed pods. I have had lots of failures owing to erratic weather conditions. While I have had a fair measure of success in cross-pollinating some Orchid flowers I have failed entirely with others. I have never produced fertile seed pods of *Cattleya* or *Vanda.* I have cross-pollinated again this year trying to solve the problem. For those people who may be interested enough to try their hand at hybridizing, I would say, never be afraid to try a cross that has already been produced. You may have parents of outstanding qualities to breed from, the resulting hybrid may quite outclass the former. Do not hesitate to self-pollinate any good hybrid you may have in your collection. There is always a chance that some good and improved qualities may come out in the seedlings that were dormant or recessive in the parent.

Should you desire to learn and understand more about this, read a standard work on Mendelism. I have often heard people say that *Epidendrum Boundii,* which grows so well in our gardens, is a first or primary cross. If that is so, we have had the pleasure of seeing a splendid example of this law relating to recessives. Some months ago one of our members, Mr. J. Smolensky, exhibited a seedling *self* of Epi. Boundii raised by Mr. Johnson, the colour of the flower was a uniform deep yellow. *Epidendrums* are hardy, vigorous growers, and prolific bloomers. For these reasons alone, they are worth working on from the hybridist's point of view. They may be crossed with *Cattleya, Laelia, Brassavola, Sophronitis, Calanthe, Schomburghia* and some others. What a wide field for the amateur hybridist to cover. I have a number of *Epidendrum* hybrids coming along in my glass-house. Notes describing these were published in the Australian Orchid Review, March, 1943. You will notice that one cross is *E. Boundii* x *E. radicans,;* you may wonder why I used *radicans,* which was one of the parents of the hybrid *Boundii. E. radicans* is an insignificant flower in comparison with *E. Boundii,* but is more brilliantly coloured. In my opinion, the seedlings should inherit the form of *Boundii* and the more vivid colour of *radicans.* The illustration I have given you here, should serve to remind you that even limited material may be used to great advantage.

Most of our native Dendrobes are worthy of the hybridist's attention. They are also very hardy and easily raised from seed. *Cypripediums* are easy to hybridize, and should be easy to raise if you can find some way to keep the seed on top of the compost. Recently when repotting some *Cypripediums* which required attention, I was surprised to find half a dozen small tubers. I decided that they were what the label on the pot described as *Cypripedium callosum x C. tonsum**. They were a creamy white in colour. One plant even had tiny leaves of the same colour. They were about half an inch long and, in spite of all the tender care I gave them, only the one with the pair of leaves survived. In future, I intend to use a tight top compost in the seedling pots. The plants referred to above were down 1½ inches in the compost. My *Cypripedium* hybrids are primary crosses, and I do not expect anything startling from them. It is good experience and interesting work raising them. After having produced their own fertile seed pods you will want to know something about raising the seedlings.

There are three methods of propagation. Direct on the compost of an established plant symbiotic, and non-symbiotic. I believe the most successful method is non-symbiotic, and the simplest is the direct method. My plants are being raised on the compost of mature plants. By this method germination is often high, but losses are correspondingly high. Here are a few experiences I have had raising seedlings. The first seedlings produced were a *Phalaenopsis* cross, 30 lovely plants I settled transplanting. Due to my ignorance and inexperience I treated them as if they had the appetite, and constitution of an adult. The loss of those plants was a very sore point with me. Nevertheless I do not overlook the fact that the loss sustained does not outweigh the experienced gained. Baby Orchids are no tougher than any other kind of baby. The proper treatment for baby Orchids raised by the "Direct method" is to leave them

**Cypripedium x Felicity.*—Hon. Edi.

in the mother roots where they will be amply provided for. In due course they will emerge from babyhood. Added growth and a proper root system to feed it denotes that the plant has become quite independent of parental care. The plants should be transplanted just as they are about to break from rest to active growth.

The next trouble I had was when slugs polished off a fine batch of newly transplanted *Epidendrum* hybrids. It was not the slugs' fault, you know, they have to eat to live. Ignorance and inexperience again on my part. The slugs taught me to understand that they are partial to the young succulent growths of Orchids. Now, I suspend the plants where the slugs have no chance of reaching them. I have often heard people say that seedling Dendrobes can be forced, and grown on without any period of rest. This is pure rot, they require exactly the same treatment as the older plants. They have a period of growth, and then as the weather becomes cooler they go to rest. Water at this period will not make them grow, but it will certainly kill them. When the older plants of the same species break away into growth, the babies will break with them right on time. If you try to beat Nature, you will fail badly. Be wise, watch and study Nature, use her and help her to attain your ends as she uses and helps you to attain her ends. Good cultural methods applied during the period of growth is the only way to send the plants along. If you would like to propagate your own seedlings I recommend that you read and follow "Symbiotic and Non-symbiotic Propagation of Orchids from Seed" by S. M. Hosking, A.O.R. June, 1941.*

I would urge growers, particularly the younger people, to try their hands at hybridizing Orchids, and propagating the seedlings. We have the advantage of being able to work under natural conditions, thanks to our wonderful climate. There is still a good stock of virgin material to work upon. It is fascinating work, it creates desire, anticipation, and develops the finer traits in your character. Outstanding examples are admired and appreciated by all mankind, and when you have gone, your work and art will live on in the service of those who follow. Living monuments of usefulness and beauty will serve to remind others of who you were, and what you were.

*See also "Raising Orchids from Seed" in this issue.—Hon. Ed.

New Address.—The O.S. of N.S.W. now meets at the Royal Empire Society Hall, 19 Bligh Street, Sydney.

● ***"Stimulation of Orchid Growth."***—Further to my article on this subject, which appeared in the March issue of the *Australian Orchid Review* with photographs of *Dendrobium nobile* plants, I wish to report that the plants have now finished this season's flowering. The plant with flower pseudobulbs produced its successive pseudobulbs equal in length and bore 70 blooms, despite one of its pseudobulbs having been broken by accident. Many of the flower spikes or sprays carried four blooms, instead of the usual three. The plant, with many pseudobulbs, also behaved in a similar manner, and bore the amazing number of 574 blooms. The blooms did not hold quite so long as usual, but this is believed to be due to the very severe winter experienced. Both were a beautiful sight. They are only now (November, 1943) beginning to make new growths, which are later than usual, this also being attributed to the severe winter.

For the ensuing year's growth, one application of liquid manure has been given to neutralize a little of the acid application of tannin on the previous occasion. Following on the theory of not having the compost too alkaline nor too acid, a decision has been made to give successive applications throughout the growing season with weak solutions of blended elements. A quantity of liquid manure is being mixed with a quantity of tannin by which the medium will be neutral, to see if the plants will respond to this as a stimulant. If so, it will prove that nutriment is derived directly from the manure. A report will be made again next year.—J. H. Skerman, Maleny, Queensland, 28/11/1943.

● *Dendrobium x Gatton Belle* is truly a lovely *Dendrobium*. The sepals and petals are of a brilliant rose-pink, the throat of the labellum being white, tinted purple. The mass of 27 flowers on one spike commanded much attention. The plant is sturdy, and improving yearly on the previous lead. It is potted in fibre only, and the pot hangs in such a sparsely shaded teatree structure that it could scarcely be called shading at all. It is, however, well protected from southerly and westerly winds. There is no particular routine for watering, receiving water about once in a week in addition to dew and rain. The method of culture of this fine plant will probably come as a surprise to those who have found *Dendrobiums* difficult to grow and flower. Shown by Dr. A. C. Burstal at the November, 1943, meeting of the O.S. of N.S.W.—W. Worth.

Observations of an Orchid Lover

R. B. HOGG, *Brunswick, Vic.*

● I have been asked to contribute to the pages of the *Australian Orchid Review,* and I feel that such a request is fully justified, for we Victorian growers enjoy the journal and give little in return.

In writing this article, I propose to generalise rather than to endeavour to teach other people how to grow Orchids, for I am certain that methods adopted in Sydney would bring nothing but failure in Melbourne, while methods adopted in Melbourne would require to be considerably amended to suit Sydney's climate.

My introduction to the Orchid world is rather interesting. I have always been very interested in gardening; as a young married man my ambition was to have my property always looking pretty. To a degree I succeeded. I then became friendly with the authorities at the Fitzroy Gardens, built a small glasshouse, and grew Begonias, Cinnerarias, and Cyclamens under their instructions with considerable success. I was persuaded to buy a few Orchids, and after an introduction to Mr. Basil Hodgins, I obtained from him a few plants of *Cypripedium insigne, Cymbidium Lowanium, Cypripedium Pauwelsii,* and similar types. These proceeded to die a natural death, as Orchids will not grow under the conditions necessary for Begonias. To save my small collection, I built a glass-house suited to Orchids, and my plants thrived, chiefly by following the Japanese method of copying, for I scrupulously followed the methods of my mentor, Basil Hodgins.

As the years went on, I developed a degree of individual skill, and felt that I was capable of working more on my own initiative, but still had great respect for the opinion of my mentor.

I started importing plants from England, firstly by arrangement under the personal care of ships' officers, later by air mail. I also bought a division of every local plant worthy of my collection. I added more glass, but even now my accommodation is very limited, but sufficient. My plants did so well that I had to start culling. That was many years ago, and since then I have culled my *Cymbidiums, Cypripediums,* and *Cattleyas* as many as five times, each time to a higher standard, and I have now to face the alternative of more glass or a still higher standard, and probably the latter will win, for as things are to-day, I have not the time to attend to more. For many years, all income from plants and flowers was invested in better plants, and this is still my policy.

I have not contracted "Westonbirt fever" yet, although I recognise the value of the product of this parent. *Cymbidiums* offer such a variety of colour (lacking in Westonbirts) that a collection of Westonbirts, in my opinion, is not a collection of *Cymbidiums.* In Victoria, there exists a lot of colour with form approaching that of Westonbirts, these include *C. Ramboda* in shades of green and bronze; *C. Eburneo-Giganteum x Pearl magnificum* in shades of yellow and orange; *C. Ruskin* in lovely shades of deep pink; *C. Joy Sander magnificum,* a magnificent chocolate; *C. Ceres F. J. Hanbury,* a brilliant red; varieties of *C. Susette,* all lovely pinks; *C. Grand Monarch Exquisite,* an immense yellow-green, spotted all over; varieties of *C. Roxana* in shades of yellow and green, all very lovely. These are but a few, but no collection of modern *Cymbidiums* is complete without them.

We in Melbourne were very fortunate, for the dispersal sale of the late A. M. Nicholas's surplus, offered most of these as unflowered seedlings at a moderate price.

In recent years my desire has been to build up a collection of *Cymbidiums, Cattleyas,* and *Cypripediums* of a standard which will make them all suitable to be used as parent plants, and I propose to endeavour to master the most difficult of all problems in Orchid growing—the propagation of Orchids from seed. I have a plant of *Cym. Alexanderi,* Westonbirt variety, many varieties of *Cym. Nadina* and *Cym. Janette* to use as base parents, with the highly coloured varieties in an effort to produce coloured seedlings of Westonbirt quality, and we hope, better. There are more pitfalls in this growing from seed than any section of the cult. You can every year produce a few around parent plants, but your germination is probably not better than one in a thousand; on the other hand, on agar countless thousands of seedlings can be produced, but relatively few saved. I have the *Cymbidium* fungus, but as yet have not proved it to be of value, and have got best results by transplanting back into flasks on to a mixture of fibre and moss when the seedlings are very tiny, but it is a very tedious job. I am trying other methods, but will keep them a secret until they succeed.

There is little doubt that the secret of growing Orchids is in the combination of the amount of air, light, water and heat used, and the only way to find this out is by trial and error. It requires an instinctive knowledge of these factors similar to that of a good mother, who knows that baby is sick, while the husband is sublimely ignorant of the fact.

I divide my *Cymbidiums* every year, and yet they thrive. I pot as soon after flowering as possible, and thereafter I cannot put my methods on paper, for I regard them as instinctive. In Melbourne we are disappointed if we do not flower 80 per cent. of our mature plants, and this I think, is due to our recognition of the unsuitability of our climate, and the consequent use of glass and artificial heat. Ours is a dry climate and in consequence, we can use an abundance of water without doing harm. Shading is, in my opinion, most important, and anything approaching a glare is very harmful to Orchids, and encourages thrips, by far the Orchid's greatest enemy here.

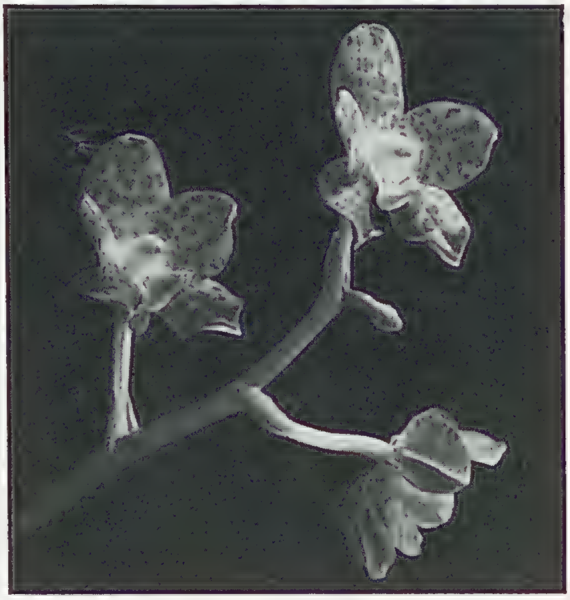
I saw Bisset's show this year (1943) and while I greatly admired a number of the plants, I feel that you can do much better, and fill all the benches with plants approaching the best quality. You have immense stocks in the various Sydney collections, but your annual percentage of flower is far, far too low. I cannot offer a reason for this, but feel confident that an active Society such as the O.S. of N.S.W. will find the reason and the cure—perhaps greater use of glass, more ventilation and shade, and less heat than in Melbourne may be it.

Perhaps the most discussed factor in Orchid growing in Sydney is that of compost. Some growers seem to have considerable success with tan bark, while others do not. Similarly with a mixture of soil and fibre. I rather think that each grower must develop his own mixture, which is suited to his natural tendencies in caring for his Orchids. I would think that tan bark would provide an excellent medium for the grower who uses a profuse amount of water, by reason of the very rapid drainage, while the grower who restrains the use of water, could expect nothing but failure with it. On the other hand, the grower using a soil mixture with poorer drainage facilities would obtain most success where he did not over-water, and would meet with failure where he used large quantities of water.

I do not think any Orchid, except, perhaps, a *Cattleya* when it is resting, likes its compost to get really dry, and I am certain that no Orchid likes to be saturated with water. Growers should endeavour to carry out a self-analysis on this point, and develop their compost to suit their own particular tendencies and growing conditions.

At the outset I said that I just proposed to generalise, and this I have done, and in concluding, I express the hope that my readers have not been too bored, and that such criticism as I have offered is taken and accepted as being purely constructive.

● ***Vanda x Marguerite Maron.*** (Vanda suavis x teres).—"A strong growing semi-terete hybrid from Java bearing more characteristics of the latter parent, particularly in the colour of the flowers which are rich salmon pink, while the lip is striped with gold. It grows rapidly and flowers freely if given adequate sunlight. Potting compost consists mainly of hard lumps of cow manure interspersed with broken crocks, osmunda fibre and silver sand. The usual flowering period is late winter and early spring. A curious feature of the inflorescence is that the flower spikes grow horizontally from the main stem of the plant and remain in full beauty for almost one month."—*T. C. Harveyson.*



VANDOPSIS PARISHII, *Schltr.*
Natural size, 40 m.m. across petals.
Grown and photographed by P. A. Gilbert.

Messrs. Shepherd & Newman Pty. Ltd., Yurong Street, Sydney, N.S.W., publishers of the Australian Orchid Review, have relinquished their box at the G.P.O., Sydney, and request that all correspondence be addressed as above.

Raising Seedlings of Epidendrum O'Brienianum

F. DOUGLAS, *Mosman, N.S.W.*

● During October, 1938, at the initial Orchid Exhibition of the N.S.W. Orchid Society, there were a number of donated *Dendrobium* flowers and plants on display, and bearing an intimation that they were being sold on behalf of the Society.

While moving round the benches with my son (then aged 9 years) I was informed that he had fourpence to spend, and would like to buy a plant. Naturally the remark was treated as a joke, but noting Mr. H. C. Slade's exhibit of sterilizer, flasks, agar-agar, and I think seed, and seedlings, prompted me to advise the boy that he had no hope of a plant, but that his wishes could best be realized by growing some from seed.

Some time later, when visiting the then Hon. Treasurer, Mr. T. Nelson, the boy observed some seed pods on *Epidendrum O'Brienianum,* and forthwith requested a pod which had just burst. A week or two later on checking up to see what the boy was doing in the bush-house, he was found with a bottle, a jar of Mum's jam, and was engrossed sifting soil into a pot, preparatory to sowing his seed. With the ruthlessness of an inquisitor he demanded particulars as to when, what, why, how, and Dad was sorely tried to answer the simple test questions of elementary training while yet suggesting that he adopt one of several practical methods available, and within the compass of any and everyone. It was hinted that it would be a good idea to eat the jam, because although the modern method of raising seedling Orchids did utilize glass containers and jelly, mother's jam and pickle bottles would not be likely to give satisfactory results. In fact, few, if any, of the local devotees of the agar-agar technique are succeeding, although all can supply the answers, most are even prepared to write them, even though the final proof evades.

To date in New Holland, understanding or theory is ahead, far ahead, of practice. How the pendulum has swung can best be described by quoting the Encyclopaedia of Gardening, 1877. (The Dutch and Flemings have few authors—the reason being the universality of practical ability).

In the belief that universality of authorship was not yet complete, it was decided to make the seed sowing a combined effort, and because of the abundance of seed it was made comparative and comprehensive.

A few were sown or distributed on the top of the material in each Orchid pot on the premises, as my grandfather did long, long ago, and I had copied some years later with "Slippers," when a few came up on the benches, but none on the pots.

No *Epidendrum* seedlings were observed on the pots or tins of *Epidendrums* which were grown in full sun, with reflected heat, and were watered by hose with or without a sprinkler. Perhaps they were washed away either into or out of the container, or maybe the application of liquid manure and fertilizers made them still born. I know not. Only a few were ever noted amongst the *Cymbidiums,* and only with *grandiflorum.* Their aspect was almost full sun, normal watering and a very weak application of liquid manure, no fertilizers. None were produced on Dendrobes or *Thunias* growing in the open and unshaded, but a few did put in an appearance on Dendrobes in the bush-house. An interesting point is that two of them are still there and do not appear to grow. They are about two inches high, others are over two feet. The Dendrobe (*thyrsiflorum*) grows well, just for contrast, and to keep one guessing, most *Cypripedium* pots produced seedlings. Very few on the healthy good plants, or those potted with tan bark, todea or peat moss, but on those growing in, or topped with sphagnum moss, seedlings were numerous, except that on the spaghnum they all grew well and generally the "Slippers" stood still. Seed sown on towelling laid on a wad of spaghnum in pots set in a saucer of water and covered with a piece of glass came up in thousands after appearing first like algae, then like sago.

When autumn arrived all were looking well, nice plump peas on the material, bit of a stem with a few leaves, and here and there the primary root emerging from the stem above the enlarged seed and hugging it to get round the protrusion and into the material. Subsequently there were a few dull, muggy days, and doubtless a careless or afternoon watering when a damping off or fungus ran through them and skittled thousands. It was worse in the pots of spaghnum and seemingly tapered off according to the number of seedlings in a pot. In an at-

VANDA x MARGUERITE MARON
Grown by T. C. Harveyson. Photograph by Dorothy Coleman Studio.

tempt to stop the rot a few hundred were pricked off into boxes with a very open *Cymbidium* potting mixture. Its passing equalised the number in each pot. If four seedlings were in a pot they all survived. If 400, few more seemed to survive. Up to that time watering or treatment was solely applied for the Orchids. The fact that there were seed or seedlings, did not influence or alter normal procedure.

From that experience it was surmised that the best germinating medium, and conditions were also the most conducive to disease. A medium like tan bark, although poor for germination in like circumstances was apparently best for carrying them past the difficult first winter. It also determined that it would be preferable to sow the seed in spring so that the seedlings would have ample time to become self supporting, and strong enough to stand up to cold feet, and infection during the first winter.

With the advent of spring, seed sowing with *E. Boundii* followed similar lines, only a few dozen *O'Brienianum* sat up and took notice. They were potted singly into thumb pots plunged in spaghnum and set in full sun. The conjecture of what they would produce and when, can best be left to the imagination.

Being a hybrid it should have recessives and throw back to either parent (Xanthinum or Evectum—see *Orchid Review,* January, 1943), hold similarity to itself, and no doubt go forward either to some dominant characteristic or even be like Burns or Shakespeare, and have a combination of qualities the others certainly never had. Omit the possibility of them being fixed, that their introduction to floriculture took place so many years ago (70 years), that they might have lost the habit of a hybrid, and be in verity a true variety, reproducing itself truly from seed.

A peculiarity at that time was that no seed pods ever formed on any of the flowers, even although I tried to fertilize them in various ways by self and cross. Nowadays, when I had given it up as beyond me, they set seed pods all over the place. Agency unknown, but it may be ants.

When about one year old, and four inches to

6 inches high, they were potted into 5 inch pots. Any material was used provided it was of an open texture and moisture holding—old turf, leaf mould, tan bark, fibre, moss and staghorn peat, with cow manure—to make it rich, and crocks and charcoal to keep it porous and sweet.

The second year the leader did not grow more than an inch or two, but three or four laterals came away and outgrew the leader. The foliage appeared to vary slightly from that of the parent, and from each other, but, quite conceivably that is, or may be, a chimera, and the result of wishful thinking. They also had far more aerial roots than plants from cuttings. I believe that the number of aerial roots is largely determined by the soil, situation, and treatment given. With me *Epidendrums* produce prolific aerial roots when planted in a dry spot in the garden or when grown in shade or bush-house. As the roots detract from their appearance as an ornamental plant most of them are grown in containers set on concrete in a saucer of water and in a full sun position. Grown thus, aerial roots are not encouraged and any that do appear travel direct to the container. The saucer is removed and afternoon overhead watering omitted when autumn approaches, otherwise that disfiguring black spot will damage the leaves and plant. Growing them in tins or applying sulphate of iron prevents spotting without apparently affecting existing spots. They also resent being watered when the thermometer soars to the century mark.

The third year finds the leader almost stationary. The primary laterals extending a little, but laterals from them grow strong and long, aerial roots generally out of all proportion to cuttings, potted into 7lb. jam tins. Anxiously looking for first signs of a sheath at the terminals.

Fourth year: Splendid plants, in wonderful condition. Cuttings would have flowered in half the time and at half their size. Only one set the pulse beating faster by giving first the promise of a flower, then the reality.

Observing it each day to see how it was progressing and wondering just what it would be like. The strain on the nerves and imagination was excessive. I have as an "old soldier" seen a fence post move but not that *Epidendrum* flower spike. It seemed ages before the first flower opened, although it could not have been more than three or four months. Judge the dismay, chagrin, and disappointment when it did open and disclosed a similarity to the seed parent.

It was exhibited at the December, 1943, monthly meeting of the O.S. of N.S.W.

Another year has come and gone since these words were written. Another dozen have flowered. All could be classified as identical, although there have been slight, very slight variations in the depth of colour, and also in the size of the flower.

● Membership subscriptions to the Orchid Society of New South Wales for 1943-44 are now due, and payable to the Hon. Treasurer, Mr. J. Bisset, 48 Wareemba St., Abbotsford, N.S.W. Members in arrears are requested to post their remittances by return mail.

● *Dendrobium x Thwaitesii, Veitch's var. F.C.C., R.H.S.* This plant was very small when imported from England a little over two years ago, but has grown stronger each season, and this year rewarded Mr. W. Worth with clusters of lovely golden flowers with a deep purple red blotch. It is surprisingly easy to propagate, and grows well in a lightly roofted lattice house well protected from the southerly and westerly winds. The potting materials are fibre and crocks only, but a moss has appeared on the surface and seems to serve a useful purpose. *Densiflorum, thyrsiflorum, mobile, x Owenianum, Jamesianum, x Merlin, x Austinii,* are all doing well under similar conditions. Shown at the October, 1943 meeting of the O.S. of N.S.W.

● *Cymbidium x Louis Sander, var. Girrahween.* —This plant was given its varietal name locally, and called Girrahween after the nursery of Mr. C. H. Deane, who imported the plant. The plant shown was a green leaved pseudo-bulb which had carried two spikes of flowers in October, 1942, and then had been separated from the parent plant, and subsequently grown by the exhibitor. At the present time (December, 1943) after 14 months culture it was a three pseudobulb plant, one pseudobulb carrying a small spike of 4 flowers, and there were 5 strong new leads. The compost was leaf mould 4 parts, sand 1 part, tung husks 1 part. Other growers who have this variety know that it is a particularly strong grower, and all have had good results from it. Nevertheless, only excellent culture on the part of Mr. R. Dart could produce such a good result. The flower is distinctive with many excellent features, and deserves a varietal name, and it is recommended to those wishing a distinctive *Cymbidium* of robust growth, and free flowering habit. Shown by Mr. R. Dart, at the December, 1943, meeting of the O.S. of N.S.W.—Dr. J. A. Vote.

Flowers

W. PALMER, *Drummoyne, N.S.W.*

● After searching numerous catalogues of various firms and countries, I was struck by the names of Orchids that have survived through the years, and still appear in modern lists along with some of the so-called ultra-modern types. Most of them have never won awards, but our English and American growers still consider them of high quality and decorative effect. Many of them, if exhibited in competitive effort with their modern cousins, which are used as standards by our judges, would not be given a second glance. Whilst our judges give a fair and impartial decision, they have had no opportunity to see the standards set by overseas judges, and would no doubt be surprised if those same judges passed over some of their decisions and gave their verdict in favour of flowers that seemed less showy or perfect to them. In New South Wales over the last few years growers have sought out large sized flowers for exhibition. In comparison, many of these flowers—and the writer has both types—are coarse in comparison with the smaller blooms.

In the *Cymbidium* flowers, large flat petals as in the "Westonbirt" type, in *Cypripediums* the large upper and lower sepals, in *Cattleyas* large sepals, petals and labellums are all sought after. Now take some of the older flowers that do not possess all the features just mentioned, but still hold their own over many years. From 1910 to 1937 the names of *Cattleyas* (including the various generic hybrids) *L.C. Luminosa, L.C. Bella, L.C. Dominiana, L.C. G. S. Ball, C. Enid, C. Harold, C. Octave Doin, C. Sauvior, B.C. Lemannae, B.C. Cliftonii, B.C. Thorntonii,* and *B.C. Veitchii* appear. In 1910 there were not many hybrid *Cymbidiums* in existence, but in the course of years the following still appear, *C. Gattonense, C. Holfordianum, C. Wiganianum.* In my list *C. Swallow* is shown as *Alexanderii x Pauwelsii;* but Westonbirt is not shown as being in its parentage, as in *C. Bodmin Moor* (*Alex W. B. x Erica Sander*), or *C. Janette* (*Alex W. B. x Joy Sander*). Why are so many Cymbids given this distinction when not entitled to it? *Cypripedium* names are endless. *C. Actaeus, C. Gaston, C. Gaston Buttel,* the *Leeanum* family, *C. Maudiae magnificum, C. triumphans, C. Rosetti,* and *C. Thalia.* Many of these flowers could not compare with *C. Grace Darling, C. Mildred Hunter,* or *C. Rhine* in competition, but are still beautiful in form and colour. As one trade journal puts it: "Many flowers from one seed pod are as good as the flower that gets an award, but cannot claim this distinction because they are only as good as the plant shown, and cannot be sold as award flowers."

When it comes to comparisons, what could look nicer than a nice plant of *Cymbidium Lowianum* with 15 or 20 sprays of flowers, or a nice plant of *Cypripedium insigne* with 20 flowers, and last, but not least, a pot of *Dendrobium nobile* carrying 100 or so nice blooms, any one of which, although old to most growers, is still "a thing of beauty and a joy forever." These still appear in catalogues in every country where Orchids are grown.

● Mr. Palmer, in his article on "Flowers" overlooks the fact that many illustrations and descriptions are available, showing the inclinations and decisions of judges in other parts. Mr. Palmer also unconsciously acts as a judge when he tells us that many of the old types "could not compare" with the recent ones "in competition."

● *Chysis bractescens.* This plant is of comparatively easy culture and was bought by Dr. C. Hall in Japan six years ago. It should be repotted after flowering, taking care that the junction of the new pseudobulb with the old is only just covered. Propagate by laying a back bulb on damp moss, and when it shoots, and roots appear, do not detach, but plant the whole with the roots just dipping into the compost of fibre, moss, and leaf mould. The plant carried 4 white flowers with yellow labella. Shown O.S. of N.S.W., 28/10/43.—W.W.

● *Ansellia gigantea* (*A. Natalensis*). This species was procured from Mr. Webb about 12 months ago. It takes time to establish itself. Usually grown as a *Dendrobium* in fibre and moss. This plant was in a large glazed pot. It carried small dark flowers that last a long time. Dr. J. H. Vote appears to have a liking for miscellaneous things, and this plant may be regarded as a novelty. Shown at the October, 1943, meeting of the O.S. of N.S.W.—W.W.

● Subscriptions for the Australian Orchid Review, 6/- (six shillings), should be posted to Australian Orchid Review, c/o Messrs. Shepherd and Newman Pty. Ltd., Yurong Street, Sydney, N.S.W.

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AUSTRALIAN ORCHID REVIEW

Volume 9 **JUNE, 1944** No 2

The author of each article is responsible for the facts and opinions expressed therein.

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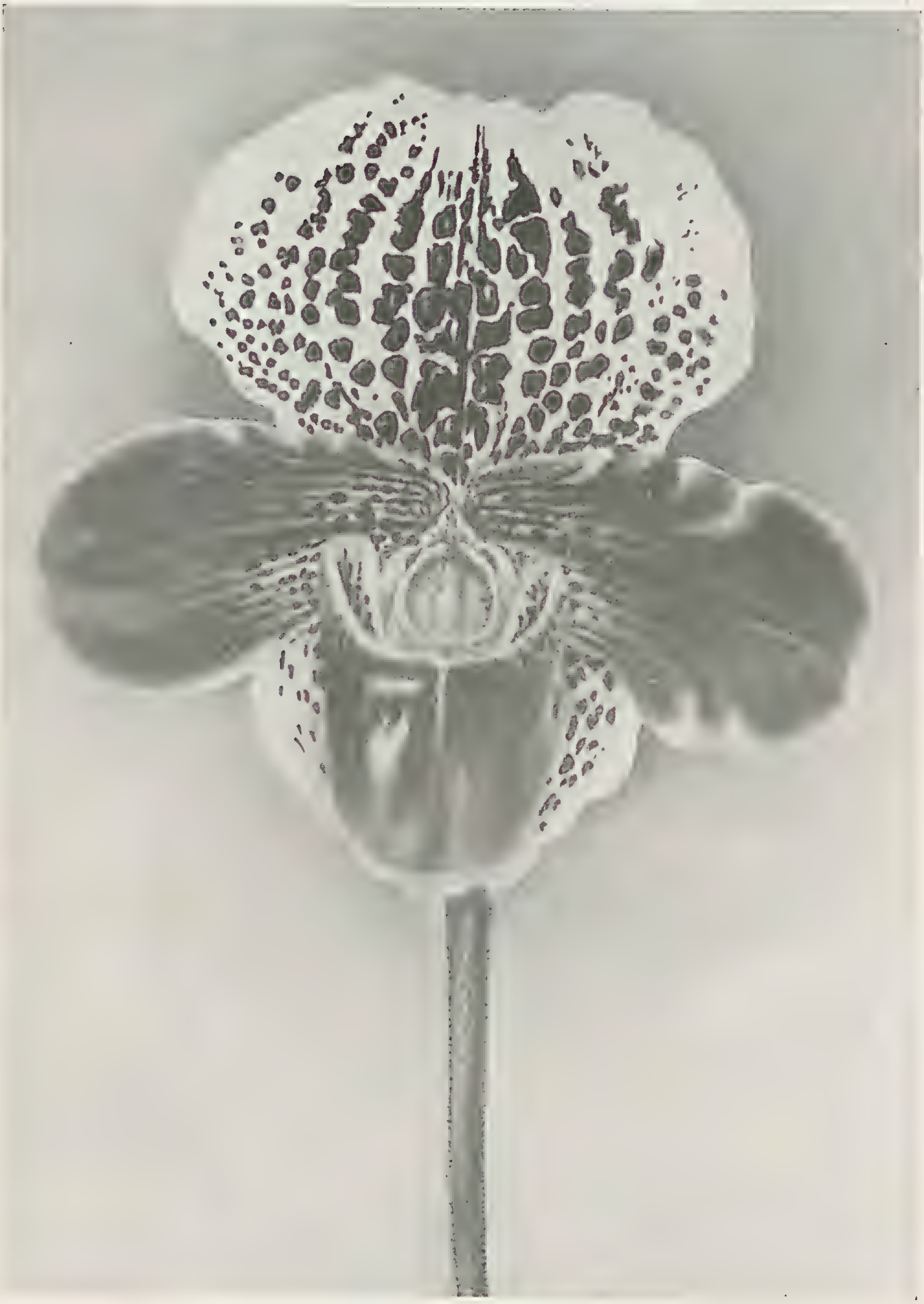


CYPRIPEDIUM NATICA
Grown by W. Fahey, Waverton, N.S.W.

Some Observations on Cypripediums

W. PALMER, *Drummoyne, N.S.W.*

● In contributing this article I hope to interest many of our newer growers in this delightful branch of the Orchid family, and to try and persuade some of the more conservative growers to try several of the ideas I will express herein.

Distribution: *Cypripediums* are found in many parts of the world, but the two genera of most interest to us are the *Cypripediums* of the Asiatic countries, and the *Selenipediums* of South Africa, both of which genera have been shown at the meetings of the O.S. of N.S.W. from time to time. I will also make reference to the modern hybrids which have also been exhibited here. Whilst most *Cypripediums* are terrestial plants, some like *C. barbatum*, grow both on rocks and trees, also in the ground. Others, like *Charlesworthii, callosum*, and *bellatulum*, grow on limestone rock faces, and with such a wide divergence of growing habits, one must bear this in mind when potting.

Potting: When potting *Cypripediums*, and this can be done with care at any time, use a pot that will give your plant two years growing space. Do not overpot, as this sets up root rot and also collar or rhizome rot in your plants. In many of the new hybrids of the *Callosum Sanderae* group from which *C. Maudiae* and other green hybrids are derived, small pots will be found a distinct advantage. Some of the finest mottled green leaf hybrids I have seen were grown in 3 inch and 4 inch pots.

Potting Mixtures: Many and various are the mixtures advocated, from fibre and moss down to tan bark. Personally I have found that *C. insigne* and *villosum* like a mixture of loam, tan bark, and cow manure. In *C. bellatulum* and *Charlesworthii* finely chopped fibre, ground oyster shells, or mortar from an old building make an excellent mixture. In all the hybrids I can recommend a mixture of tan bark two-thirds, builders, or Nepean sand one-sixteenth, and cow manure one-sixth. I have found that tan bark in itself is not really sufficient nourishment for the plants. One of Mr. Louis Cohen's directions is that *Cypripediums* in tan bark must be watered every day, summer and winter, and this brings me to the subject of watering.

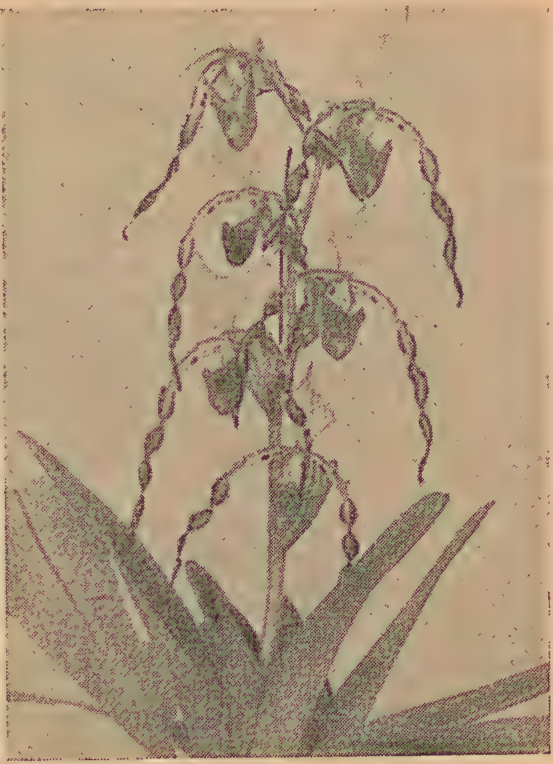
Watering: Having no pseudobulbs, being unlike *Cymbidiums* or *Cattleyas*, in this respect, *Cypripediums* depend entirely on their root systems for water and nourishment from the mixture around them, and this again brings back the question of pots. A pot too large, holding too much moisture can do a great deal of harm, and a small pot which cannot hold sufficient can cause that sad, pinched, and folded leaf you often see in *Cypripediums*. I find you cannot overwater in summer, but as the cooler months, May to September, draw round it is better to take your plants one by one and examine them and water those that are dry. Also be careful of overhead watering as *Cypripediums* bloom all the year round, and water in the throat of the plant, if undetected, can do a lot of harm.

Diseases: *Cypripediums* are subject to very few diseases, the main three being thrips, rhizome rot, and mealy bugs. The conditions favourable to thrips are dryness, excessive warmth, and lack of ventilation, and usually their appearance is indicated by rough shiny patches on the leaves of the plant, and these after spraying with a suitable solution turn gradually brown. The washing of the plant's leaves will clear away the mealy bugs, both operations should be done about three times in a fortnight to eradicate these insect pests. The rot that takes place at the rhizome of the plant can best be treated by putting the plant in a new dry compost mixture, and rubbing sulphur on the affected part. Small drinks of water to the plant will help to a great extent in keeping the plant alive during the drying out of the rot.

Growing Position: *Cypripediums* grow equally well indoors or out-of-doors, in the glass-house, the bush-house, or in among your *Cymbidium* pots. The better class hybrids of course like glass-house treatment, but I have seen them growing equally well out-of-doors at various homes of Orchid growers. I always recommend open wooden benches for the pots, as these give a free flow of air all round the pots and allow good aeration through the pots when watering is done. Do not crowd the plants together on the benches, 4 inches to 6 inches between pots is not too much. *Cypripediums* like light. They will take a fairly strong light without harm, but it is advisable during the very hot months, November to March, to have some light scrim shade over the plants.

Flowering: Whilst it would be foolish to compare them to the delicate *Cattleya*, or the lordly *Cymbidium* for show, the *Cypripediums* will, and do flower all the year round. While this also applies to *Cattleyas*, the *Cymbidiums* only flower from about May to November, a period of seven months. So you see the *Cypripedium* has a lot in its favour with regard to flowering. Judicious buying of species and hybrids can give the grower all the colours of the rainbow, and I have read somewhere that Orchids are the only flowers that have these colours, white, green, pink, brown, yellow, red, purple, and many other shades can be had. After a few years good growing one can have displays like the glorious plants which Mr. Louis Cohen shows us from time to time, or the fine plants exhibited by various members of the Orchid Society of N.S.W. at its meetings. Many growers regard *Cypripedium* flowers as "hard" looking, but after all this hard looking flower is able to stand up to the *Cymbidium* in length of life, and often supersedes it, as shown by Dr. Vote with his *C. glaucophyllum* and *Selenipediums* at recent meetings of that Society.

Propagation: Propagation or increasing one's plants is done by division after flowering time, and is a very simple operation. Where two or more old flowered growths are on the plants these can be taken away and propagated quite easily. Put in a dry mixture or in a pot of green growing moss they develop new growths in from three to six weeks and can then be potted off in the usual potting mixture, and gradually built up into plants for exchange.



CYPRIPEDIUM PARISHII
Grown by B. Parry-Williams. Photo by N. Cobb, Dee Why, N.S.W.

Queensland Orchid Society Office Bearers for 1944

● At the Annual General Meeting, held on February 11th, 1944, the following gentlemen were elected to office for the current year—

President: Mr. C. A. Hilsden.

Vice-Presidents—Metropolitan: Messrs. E. J. Beard, H. Campbell and H. Stevens. Country: Messrs. A. J. McFie (Gympie), T. Harris (Coolangatta), and A. Wilkie (Cairns).

Hon. Secretary: Mr. T. C. Harveyson.

Hon. Technical Adviser: Mr. C. T. White (Govt. Botanist).

Hon. Treasurer: Mr. E. J. Beard.

Hon. Auditor: Mr. Keith Tanner, A.C.A. (Australia).

Committee: Dr. D. A. Herbert, Messrs. L. C. Home, J. Smolinski, R. G. Ferguson, C. O. Dunn, J. Lewis, H. Stevens, and D. Law.

● ***Pterostylis obtusa.***—Found on rocky hillsides in N.S.W., Queensland, Victoria, and South Australia, this Greenhood flowers in the autumn. It is a neatly fashioned little plant of about 10 inches in height. Of interest to the botanist. The 5 inch pot exhibited contained about 30 plants perfectly upright in growth. It is seldom that we find our native ground orchids cultivated. Each plant, really a single stem, was crowned with a single flower, green in colour. Four flat leaves at the base of the stem lie flatly on the earth, and the stem is also spaced with several small bracts. Remarks were frequent on the excellence of the culture. Grown in gritty, sandy bush mould, topped with a little tan bark. The grouping of the plants added greatly to their attractiveness. The plants were gathered three years ago on Bulga Mount, near Lilvale, N.S.W., by E. L. Hayes, shown at the March meeting, 1944, O.S. of N.S.W.—W Worth

New Address.—The O.S. of N.S.W. now meets at the Royal Empire Society Hall, 17 Bligh Street, Sydney.

Australian Orchids

T. E. HUNT, *Brisbane, Q.*

● The field is a large one, and, if I attempted to cover all Queensland species, not only would the matter become tedious, but a very large proportion of it would necessarily be culled from books. I propose, therefore, to confine myself to our own district of South-East Queensland, and deal with some forty or so species occurring in it, which, for one reason or another, deserve a place in your houses.

At first glance many of our native Orchids appear rather poor things, particularly if they happen to bloom beside a good, imported plant. However, if you have the patience to really look at them, you will find that they lack only size to compare more than favourably with your finest *Cattleya*. These tiny little fellows show a beauty of form, colour and design, which is often amazing in its perfection of detail.

Beauty has many facets and size is not one of them. I have yet to see a more beautiful flower than the tiny delicate bloom of *Sarcochilus Hillii*. If you are very modern and must have size and bright colours before anything else, maybe I can get you with another prong-utility. The Native Orchids do not drop their leaves readily, and so are most useful for breaking up the "dead sticks" appearance of the bush house. Again they are as a rule not niggardly with their blooms or perfume, but give lavishly of both.

It is an established axiom of life that which is difficult to get is most eagerly sought after—like petrol, mustard, or silk stockings. Until recently it was much easier and cheaper to get a plant of *Dendrobium nobile* from India than it was to find one of the rarer native species growing a few miles away. The one could be obtained without discomfort for a few shillings, the other would, perhaps, have cost weeks of searching, much wear and tear on the car, and a tendency towards a regrowth of muscles on the legs. And believe me, after shinning up innumerable cliffs, having been bitten and stung by everything that bites and stings, and after having played "Tarzan of the Apes" in many trees, that little plant would mean as much to you as your finest *Vanda*. It would give you happy memories of days well spent. I am suggesting to you that when happier days return, you take your picnics occasionally off the beaten tracks—leave the Sunday papers and books at home, and go searching for those Orchids you haven't got! The joys of discovery are strong in all of us and you will be surprised at what you do find—even if it is only a jumper's nest. Take a few specimens home and try them—a few might break your heart, but it might just as well be broken by S. *tridentatus* as by V. *coerulea!*

Finally, there is the matter of conservation. Every year more and more scrub land and forest country is cleared and the Orchid population decimated. Some species are rare now, and might soon be extinct unless cared for by those who know their wants.

I mention now only those which I have found growing in this district and which are more or less easily located.

Taking them in order:

Liparis reflexa makes an attractive pot plant with its long green leaves and rounded green pseudobulbs. The flower is small, yellowish with reflexed parts. It is generally found in large colonies on sheltered rock faces above 1,000 feet.

Dendrobium speciosum and its varieties are to be found in great masses on rocks, cliffs, and trees in all mountain areas of the district. Probably the most commonly "murdered" Orchid of the lot. As a vigorous grower and a generous given of flowers and perfume, it is hard to beat.

Dendrobium delicatum. I have sought long and earnestly but have never found it growing, although I have scrambled over most of the mountains in search of it. Reported from the Main Range and parts of the MacPherson Range.

Dendrobium falcorostrum is one of the finest of the genus in Australia. It resembles *speciosum* on a small scale in habit and growth. The sprays of creamy sweet-scented blooms make it a favourite for the bush-house. It has not been my good fortune to meet it in its home, but it is recorded for the Lamington National Park where it makes its home on those hoary giants, the Antarctic beeches.

Dendrobium tetragonum. There are at least three types of this here—a short, compact growing one, one with pseudobulbs about a foot long, thin and with a reddish tinge, and a great fat one with much larger blackish green pseudobulbs. The blooms in each case are similar, but those of the second are generally a little larger and more strongly coloured. It is a very attractive species which blooms strongly at various times during the year. The small type and the largest I have found growing only in the high scrubs, while the reddish one seems to prefer the more open country lower down.

Dendrobium aemulum, a large basket of this is a fine sight when in bloom. The reddish pseudobulbs and oval green twin leaves are very attractive. The fairly large white flowers are perfumed. Generally found growing on the rough bark of the box, *Tristania conferta,* where the forest country merges into the scrub land.

Dendrobium Kingianum is another well known to Orchid lovers. It occurs abundantly on cliff faces and large boulders on all the higher ridges of the district. A vigorous grower such as this which blooms freely and holds its leaves well should be valued by all. Like most of our *Dendrobes* it blooms from old as well as new pseudobulbs. The colour range is from pale shell pink to almost red. This may be the effect of environment, as I have heard stated, but I am inclined to think that it is more likely to have resulted from natural crossing; particularly as there seem to be as many variations in the shape of the labellum as in colour. Bailey describes a var. *pallidum.* The var. *Silcocki,* with pure white blooms lined with lilac on the labellum, is a really beautiful flower. It occurs sparingly, and I have found it only on Mt. Flinders.

Dendrobium gracilicaule is another plant which is hard to kill. It always looks well and distinguishes itself by blooming freely from practically every pseudobulb no matter how old. Its gold and red-brown flowers give the impression of being carved from one of the modern plastics. It is very common in most mountain scrubs where its long thin pseudobulbs mav be seen in great clumps on trees and rocks.

Dendrobium monophyllum, the "Lily of the Valley" Orchid grows easily on the posts and rafters of the bush house. Its dainty golden bells help its peculiar red-gold pseudobulbs make an interesting plant. It may be found in great colonies on open rock faces in the mountains, or on trees in the mangrove swamps, such as those of the Tweed River. It often belies its name by having two fully developed leaves.

Dendrobium cucumerinum occurs here, but so far has eluded me. It grows like the better known *D. linguiforme,* but the leaves resemble tiny prickly cucumbers as the name implies. It's quaintness alone makes it a desirable addition.

Dendrobium pugioniforme or "Daffee" Orchid is another plant less difficult to grow than find. The long, wiry, interlacing stems carry deep green, sharp pointed leaves. In its season it is a mass of fairly large greenish white blooms which are sweetly scented. The only place in the district where I have definite knowledge of it is the mountain area behind Boonah, towards the head of the Condamine River. No doubt it occurs sparingly in other high rain forest areas.

Dendrobium linguiforme takes up no room in the bush house as it grows most obligingly on the wood work. Its peculiar method of growth, resembling a series of green thumb nails, together with its abundant sweet smelling white flowers, make it a very attractive and unusual plant. It is fairly common on rocks and cliff faces on the higher ridges of mountains and is often to be met with on trees, lower down, particularly the "paper-barks." Besides the type there are two varieties; var. *Nugentii,* which I have met on the MacPherson Ranges, has flowers somewhat smaller than the type and white rather than cream; var. *Huntiana* favours the paper barks of the lowlands and carries blooms somewhat similar to the former variety. It blooms in mid-winter, whereas the others favour the spring and summer months. It occurs sparingly in the Ipswich district.

Dendrobium teretifolium, as its name implies, has long terete leaves falling to form a curtain from the thin wiry stems. A large plant of this or the var. *aureum* is hard to beat. At the first sign of spring its long, graceful lines seem to burst overnight into a mass of dainty white or pale gold blooms, which are strongly perfumed. Both varieties are quite common in the scrub country.

Dendrobium Becklerii has fewer flowers and seldom grows to a very big plant. The leaves are short, thick, and fluted. Its blooms, however, being cream or white with strong purple lines, are very attractive. Fairly common in any rain forest area. Colour variations occur.

Dendrobium Mortii may be sought with *teretifolium.* It is a plant of similar growth to the other "pencil Orchids," but the leaves are smaller and the whole plant much daintier. It distinguishes itself by having three, four, or even five crops of flowers in the autumn and winter. It blooms very freely, the creamy flowers in groups of twos and three being very effective in the light foliage.

Any of the "pencil" group can be attached to a tree or the roof of the bush house and left to its own devices.

The genus *Bulbophyllum* has at least eight species within the district. They are all more or less easily grown on blocks of wood or pottery. The flowers in most cases are very dainty, while the plant is generally one which excites interest.

B. crassulaefolium has small leaves resembling big green grains of wheat. The minute flowers are white. It occurs sparingly on trees in the rain forest areas.

B. intermedium has flowers similar to the former, but the leaves are much longer. It has been reported from Tambourine Mt. I have recently received plants of this from my brother from the Atherton Tableland.

B. aurantiacum occurs on trees in the high scrubs. It is a robust looking plant with a minute red flower. Unless you are very interested, don't break your neck climbing for it. The stem is long and creeping as in the two previously mentioned species, but the leaves are flat and up to three inches long.

B. exiguum forms a mat of golden bulbs about the size of a pea with, generally, a single leaf at the apex. It has racemes of small white flowers. Both it and the following members of the genus are of value for their interesting method of growth, and the delicate beauty of their tiny blooms. *Exiguum* occurs on rocks or the branches of trees in the high scrubs often in association with *D. speciosum*, *D. monophyllum*, etc.

B. minutissimum was until recently the smallest of the family. Its tiny pin head bulbs with their almost indiscernible leaves form great patches on rocks and trees both in the mangrove swamps and in the mountains. Its tiny red and white blooms are rarely seen.

B. globuliforme is a recent New South Wales discovery described by W. H. Nicholls. Some time back I came across it growing on pine trees in the ranges behind Beyden, hence its inclusion as a native of this district. This is a case in support of my plea for the cultivation of rare natives. Evidently this plant is not common, or it would have been recorded earlier, and, as it appears to favour the pine tree as a host, and as all pine trees are rapidly being cleared from the district, its chances of survival are slender.

The plant is similar to *B. minutissimum* but even smaller. The tiny bell-shaped white flowers are much larger than the rest of the plant.

B. bracteatum has bulbs about the size of a threepence, a single leaf (generally) and a raceme of purple and white blooms which are really beautiful. However, it appears rare, and I have met with it only once on the trunk and branches of a giant fig felled on the Main Range.

B. Elisae has bulbs about half an inch in diameter and long thin leaves. The yellowish flowers differ from the typical *Bulbophyllum* in that the lateral sepals are much longer than the other floral parts. It is reported as being on the high southern ranges of the district.

Next in order comes an old favourite with most growers here and overseas. *Phaius grandifolius*, a ground dweller from the damper coastal scrubs and islands. Its large, white, brown, and red flowers, and long graceful leaves make it an attractive pot or bedding plant for any bush-house. Its much more common ally, *Calanthe veratrifolia* has a similar style of growth and large white flowers which however, blacken at a touch. It frequents the moist hillsides and gullies of the high scrubs.

The three native *Cymbidiums* are plentiful enough in this district, and are very pleasing plants, although their blooms are not up to the 200 guinea standard in point of size and colour.

C. canaliculatum is particularly abundant in the open forest country where it seems to prefer ironbarks and few other eucalypts as hosts. It is a prolific bloomer with a strong perfume. The flowers range from pale greenish-yellow to the purplish-red of the northern form—*Sparkesii.* It does not take readily to transplanting.

C. iridifolium prefers to grow in great clumps in rock crevices where there is plenty of leaf mould and dampness when its pseudobulbs attain great size. It grows well also on hollow trees. Its long racemes of pale gold and green flowers are not without charm.

C. suave is a long graceful Cymbid without the usual pseudobulbs. It is sweetly scented as its name implies. It is a denizen of the open forest country where it seems to prefer the various eucalypts as hosts.

Geodorum pictum is a plant I have never seen.

Dipodium puntatun is a leafless ground dweller with dainty pink flowers occurring sparingly throughout the area. I do not think it would transplant readily unless perhaps it could be planted under a gum tree in the garden, as there appears to be a fungus necessary to its growth connecting it with the roots of a tree of this family.

Perhaps the most beautiful individual blooms, both for their delicacy of colouring and shapeliness, are to be found in the genus *Sarcochilus*, which is represented by at least ten species.

S. Hartmannii grows sparingly on the rocks of the Macpherson and Main Ranges, and is rightly prized. The leaves are succulent, while the dozen or so white and red spotted flowers about ¾ inches across are carried on a six inch raceme. I wish you better hunting for this species than I have had.

S. divitiflorus occurs in most scrub country high and low. It is well-known for its large leathery leaves and peculiar raspy roots. The foot long raceme carries dozens of large red and orange barred blooms, which, however, are not long lasting.

S. falcatus prefers the dense scrubs of the mountains. It is well known as the "Orange blossom Orchid," and is really a fine species. The light green sickle-shaped leaves make a compact, attractive plant which is easy to grow, and giving in the spring many racemes of large, white, sweetly-scented flowers.

S. Fitzgeraldii must be sought only in the moist, dark places in the ranges, where it is generally found in colonies on the rocks. It has narrow, sickle-shaped leaves and racemes of large, white flowers spotted with red. It grows well in damp, shady corners of the bush-house or glass-house.

S. olivaceus is a rarity with a few dark, sickle-shaped leaves and olive-green flowers. It should be found on trees scattered throughout the rain forest belt. Take it if possible with the part of the host of which it is, and hang in the bush-house. It will grow readily.

S. dilatatus is extremely rare, and I have been able to locate it only in one or two patches of scrub in the Rosewood district. There I have found it growing only on a spiny shrub, *Citriobatus multiflorus*. In growth it is very like *S. olivaceus,* to which it is closely allied. I have found it difficult to grow.

S. parviflorus I have never seen.

S. eriochilus has not been recorded since described by Fitzgerald. I understand it resembles *S. Hillii.*

S. spathulatus is recorded for the Tambourine Mt. area. It has not been my good fortune to meet it either.

S. Ceciliae is very common on rocks on all the higher ridges where there is some moisture and shade. The leaves are narrow and fleshy. It is very easy to grow in the bush-house either on rocks or in baskets. Provided slugs have not possession of the floor, this plant could hardly be bettered as an edging for a rockery. It repays a minimum of attention with many six inch racemes of delicate pink sweetly-scented flowers. Its popular name, "Fairy bells," is not a misnomer.

S. Hillii I have found in the Rosewood area and Pine Mt. growing in trees and on shrubs. It is not common, and its small size makes it difficult to locate. The tiny perfectly formed white flowers when viewed through a lens more than justify its popular name of "Little gem." I have yet to see a more beautiful flower. Look for a plant like a small *Ceciliae* and you may get *Hillii, spathulatus,* or the long lost *eriochilus.* The "Tangle" Orchid, *Sarcanthus tridentatus,* has many racemes of strongly fragrant tiny green and chocolate blooms. It generally hangs by one or two of its very long roots with all the others tangled into a loose ball practically enclosing the rest of the plant. However, I have seen it almost as often with all its roots fully attached to the host. It may be sought in the denser scrubs where it is quite common.

Ornithochilus Hillii has big fleshy leaves suggesting a small *Phalaenopsis amablis.* Here, however, the resemblance ends as the minute flowers are barely noticeable. Apart from its tiny flowers, however, it is an attractive looking plant, and will flourish on the bush-house posts, sending out plenty of long healthy roots. It is reported as common in the southern scrubs, but I have seen it growing only on the south coast, near Burleigh Heads.

Some of the natives are difficult to grow, and others quite easy, but if you try to give them much the same conditions as you find them enjoying in the bush, they will not disappoint you. Be watchful, however, that you do not introduce with them more pests into your houses.

In conclusion, I ask you to bear with me over the many shortcomings of this paper. The subject is a very big and interesting one, and in order to stay within a reasonable space limit, much which could have been said had to be omitted while at the same time I wished to avoid presenting you with a bare catalogue. I hope, as I said before, that, when happier days return, you will spare some time from the "big fellows" to look quite kindly on their humbler but equally beautiful brethren.

● ***Zygopetalum Blackii var. Negus A.M.***—About the best of the Zygos., and the most expensive. The flowers are scented, and are richly coloured, the lip being veined with deep violet, closely resembling Mackayi. A 6 bulb plant with 3 new growths, the spike carried 6 flowers not quite fully open. *Zygopetalums* require plenty of root room, and should be potted in an open *Cymbidium* mixture, and treated similarly to a *Cymbidium.* They will grow under glass or in shade but will not flower satisfactorily unless grown in the open. (The correct name is probably Z. *Burkei.* Hon. Ed.). Shown by Dr. K. Kirkland, at the March meeting, 1944, O.S. of N.S.W.—W. Worth.

Field Notes from a Soldier

At my previous address, Larrimah, I wrote of the hungry country, etc., being Orchidless there, but now I must repudiate that statement, because just before I moved from that area I had a trip through "We of the Never Never" country which lies about 50 miles north of my previous "home." Close by the main road the graves of "Maluka" (Mr. Gunn) Lee Ken, and a few unmarked graves of the 1903 period, all recently down, have been put up by Northern Territory Forces. Although simple, it is quite an attraction for tourists such as myself. Of the original homestead there is no trace now. A modern road passes almost over the spot but so far there is nothing to mark the spot, and the Territory being so huge and most uninteresting that any of its romantic spots should not be allowed to pass into history. A track from this spot to the present site of Elsey Station is about 16 miles, still hungry country, but wallabies, wallaroos, and bush turkeys are seen in large numbers, while black cockatoos and kite hawks were noticed by the thousands. The types of white-ant hills changed as we moved along the track. Now I have diverted from the matter, I began to write about. It was when we passed a series of flats that looked as though they would all be under water when the "wet" season started. We noticed many plants of *Cymbidium canaliculatum*—many of large dimensions—most were in flower—and were also well laden with almost ripened seed pods. This Orchid is very common throughout the north of the Northern Territory. It appears to have an extended flowering season from May to December, and the perfume at times is very delightful. I asked an old aboriginal what he called this Orchid, but it was only part of the bush to him. While I've written so much about the "Never Never" country, I may as well finish my tale of the day. We passed the famous Banyan tree, which is another part of the book, and the carving may have been done last year instead of 1902. We moved on to the Elsey Station—what a surprise in the wilderness. I shall never forget the beautiful trees surrounding the station. A few very yellow leaved Cascaras, a number of a bright red flowering tree which has beans 18 inches long, Poinsettias, Bougainvillaeas of various colours, Frangipani—yellow and pink. It was a sight for sore eyes. After passing through, and working in "the very hungry" bush, it may be of interest to say that this station has more than 5000 square miles. From here we made for our destination for the day, the Roper Falls—a delightful spot, and stories of "fish eating" crocomiles could not deter us from having a swim. The stream was too good. The falls dropped over limestone of a height of about 12 feet, there being a series of these falls for about 150 yards. Quite a flow of water even at this time of the year (Nov. 1943). We haven't had any rain since the middle of March. The seasons here are the "dry" and the "wet." Many of the lads in our party had not seen water to swim in for many months. You can imagine how we wallowed in this very delightful spot almost till dark. I spent a few hours walking down the bank of the river in the hope of finding "something" and except for many vines of native passion-fruit it was "all same river bush." A few caves that may have led anywhere but we had no lights. The caves appeared to be well frequented by denizens of the bush. I might finish with this part of the country saying it is no longer unknown and unfrequented.

That *Dendrobium* you suggested may be *dicuphum*. I have a few pressed flowers I'll send down to you. They are not the best though, although they may be a help. I have not seen any more of this species about. The flowering season of this *Dendrobe* extends from May to October. I had a few plants growing on an old cocoanut husk. These I have left down below. These are beginning to move along now. I have them hanging under a small paw-paw tree alongside a drain. At my present spot, while wandering through the bush I came across a colony of a leafless ground Orchid—spikes up to 24 inches high. The roots were bulbous or tuberous. I've pressed a few of these flowers. I don't know whether it is recognisable by them — the plant may be one of the *Dipodiums*. It has a very fleshy and brittle stem. I found this plant growing with the bush and "rubbish" that has grown since the pre-"wet" storms have started, all roughly about two feet high.

The mistletoe on the trees is rather attractive. Its red flowers do splash a bit of colour into the bush. I guess all of this is a bit disjointed, but you may get a few "tit-bits" from it to put in an odd corner of your A.O.R.. So with regards. —Sgt. Gerald McCraith, 3/11/1943.

[Mr. H. M. R. Rupp has identified the *Dipodium* as a northern form of *D. punctatum*, from the dried specimens sent by Sgt. McCraith. The *Dendrobium* is the well-known species frequenting those regions, named, *D. dicuphum*.—Hon. Ed.]

Dendrobium undulatum

T. T. TAYLOR, *Macknade, Nth. Qld.*

"The Golden Orchid" (a name that it richly deserves) is, I dare say, one of the hardiest of all Orchids, flourishing as it does under conditions that would mean certain death to most orchidaceous plants, and the following observations will no doubt surprise those growers who have not had an opportunity of witnessing the amazing tenacity of life of this plant in its natural habitat.

Numerous plants of *D. undulatum* are to be seen growing on rocks and trees high up on the "Coast" range of mountains at an altitude of fifteen to eighteen hundred feet above sea level. The bulbs attain a length of twelve to fifteen feet, particularly if the foliage of other trees or plants in their immediate vicinity attempt to deprive them of light. The rarefied air and diffused sunlight encourage this abnormal growth, and they are beautiful indeed with or without flowers. The bulbs are greenish-gold in colour, fusiform in shape, and for two thirds of their length from the apex down are clothed with lovely green, fleshy leaves. These large plants are usually shy bloomers, producing aerials rather than flowers.

Descending to a lower level in the vicinity of the foothills, the climate is much warmer, with a more uniform temperature, and a humid atmosphere. The plants in this case are minus the greenish tinge, the bulbs shorter and stouter, and greater in number, the plants being subject to more direct sunlight, florescence is consistent. The open forest country evidently promotes longer spikes and larger blooms.

Crossing the coastal flats to a strip of country approximately a mile wide running parallel with and adjacent to the coast, we find a very hot climate, with the atmosphere saline and humid. The north-east and south-east trade winds tone down the temperature considerably, the nights generally being cool. In this locality the forest lands are timbered with blood-wood, wattle, and tea-tree.

Between the forest and mangrove delta, at intervals, are low sand-ridges vegetated with a disorderly and untidy type of scrub, consisting of a motley collection of pithy and brittle timber, interlaced with vines of various species. These vines support the trees preventing to a certain extent, the demolishing effect of the cyclonic storms that visit the Queensland coast periodically during December and April.

Large colonies of *D. undulatum* have developed in this locality and continue to propagate their species by the aid of the strong winds which tear off the "aerials," and seed pods, casting them indiscriminately into the surrounding vegetation. The small plants and seedlings are strong and robust, apparently obtaining all that is necessary to sustain life "without coupons." Maybe the Golden Orchid has elected an atmosphere of disorder to exhibit its blooms in contrast with it.

Plants attached to trees that are blown to the ground do not appear to suffer injury. Their roots immediately creep down into the sand, and leaf-mould where there is an abundance of nutriment. I came across a plant that had been torn from its anchorage, and deposited topsy-turvy on the sand. And, be it noted, the recently matured bulb possessed a spike of thirty-five blooms, this fact, I consider, confirms Dr. J. A. Vote's notes in the September issue of the A.O.R., 1943, under True Maturation. As the plant had been on its head for at least six months, I have for some time held the belief that the strength matured in the previous pseudobulb induces florescence in the new lead, which, in many cases, has no roots whatever, and therefore cannot be self-supporting. After flowering, the roots make their appearance, and they are the medium by which the recently flowered pseudobulb builds up and stores sufficient strength to induce the next year's lead to flower, and so on, but this is digressing from the purpose of this article.

Other plants are growing as ordinary shrubs with their roots completely buried in sand and flowering on all but one or two "back-bulbs." Crossing over to the islands along the Queensland coast thousands of plants of *D. undulatum* are to be seen growing in every conceivable position, on basalt rocks almost destitute of compost, decaying stumps of trees, fallen timber, in fact, on anything that affords a foothold. They are to be seen also high up on green trees, the upper branches of which are covered entirely with Orchids, the ground beneath being littered with dead pseudobulbs, aerials, and old flower spikes.

During the flowering season the trees containing the "Golden Orchid" are a magnificent sight. Quite a number of plants are located in crevices fully exposed to the elements, frequently being sprayed with sea water during the south-east gales. The rain following washes the salt off with a deluge of pure water. Evidently *D.*

undulatum is not concerned with the hydrogen-ion concentration of a compost, or whether it consists of a particular fibre or moss. An aboriginal, "King Toby," once remarked (indicating a fellow tribesman), "That phella savee kia kia any-ting belonga bush," which is quite applicable to the Golden Orchid.

Whilst trailing for mackerel from a motor launch close in on Mona Rock some years ago I noticed a colony of Golden Orchids nestling in an alcove of the rocks with two or three *Pandanus* trees growing precariously above, the dead leaves from which supplied the only compost available for at least seventy plants. The number of blooms from that little colony would be in the vicinity of 12,000 for each flowering season.

The Golden Orchid has the following desirable characteristics, ease of culture, a sturdy and shapely plant, length of flower spikes, numbers and the lasting quality of its blooms, consistent flowering, and its ability to adapt itself to varying conditions. High up on the mountains the temperature in winter drops to 30° F., while on the islands many of the plants are subjected to the direct rays of a tropical sun during most of the days, resulting only in a slight browning of the leaves, and no watering other than dew at night for fully five months. In conclusion I am prepared to assist cross-fertilization by supplying free of charge, several strong plants of *D. undulatum* to any member of the various Orchid Societies, or Circles, in Australia, who would endeavour to produce something of outstanding merit, for no other reason than to push along the good cause of Orchid Culture.

● ***Thelymitra retecta,*** a new species described by H. M. R. Rupp, in The Victorian Naturalist, Vol. LX, March, 1944. Found by Neil Burrows at Gravelly Beach, on the Tamar River, below Launceston, December, 1943.

● Editorial matter, M.SS., and photographs should be sent direct to P. A. Gilbert, Hon. Editor, *The Australian Orchid Review,* 37 Colin Street, Lakemba, New South Wales.

● Back numbers of the Australian Orchid Review are still available, excepting seven issues, which are Vol. 1, Nos. 2 and 3; Vol. 2, No. 1; Vol. 3, No. 3; Vol. 4, Nos. 2 and 3; Vol. 7, No. 2. Copies of Vols. 1 and 2 are priced at two shillings each, Vol. 3 one shilling and ninepence each, and all subsequent issues one shilling and sixpence each.

● ***Cymbidium grandiflorum.***—In the February circular of the O.S. of N.S.W. there appeared a paragraph on *Cymbidium grandiflorum* which much interested me, and perhaps my experiences with this "charming but wayward Orchid" may be of interest to growers as being completely the opposite to the method suggested by Mr. F. Douglas. His suggested method of culture is to follow, as nearly as practicable, its natural resting period and which he states to be December and January. I take it by "resting period" Mr. Douglas means withholding of moisture, as in other types during their period of rest.

Now, for my experience with this Orchid. I obtained from India in December, 1938, a fairly large plant of *grandiflorum* which I potted holus-bolus after trimming away dead growths. The plant immediately responded and put up amazing growth, but, despite various conditions under which I tried it, failed to produce any sort of spike. Last August I tried what might be termed desperate remedies, for, after repoting it into a 10 inch pot, I placed the plant out in full sunlight, and on top of a concrete step where it got sun from early morning until late in the evening. There the plant stayed, and, during the summer months was copiously watered every evening. After reading Mr. Douglas's experience I decided to repot—this was at the end of February when, according to Mr. Douglas's theory it should be flowering, I found two spikes just showing up. I left the plant where it was and decided to continue the watering, and now there are two excellent spikes, one with 15 large buds, and the other with 8, just opening out. Is there any end to the vagaries of this extraordinary Orchid?

I might also mention that a plant of *giganteum* bought at the same time as *grandiflorum,* is also putting up two fine spikes, but not so advanced as *grandiflorum,* which has completely filled the 10 inch pot and has about 16 or 17 bulbs, including some that have commenced to grow in the past two months.—H. R. Colley, Jamberoo, N.S.W., 3/4/1944.

● ***Prasophyllum parvicallum,*** a new species described by H. M. R. Rupp in The Queensland Naturalist, Vol. 3, May, 1943. Found by E. J. Smith at Kalbar, South Queensland, October, 1942, "growing on a broad and almost barren rocky ledge on top of Mt. Greville, among thick clumps of grass, about 2,000 feet above sea level."

Some comments and comparisons by a Melbourne visitor to Sydney

W. A. WRIGHT, *Heidelberg, Vic.*

● Having recently visited Sydney I was requested to give my impressions of the *Cymbidiums* seen, and to compare the cultural methods used there with those adopted by the Melbourne growers. It is with some diffidence that I venture to do this, let alone attempt to advise or criticise the Sydney growers, many of whom I know personally. Could it be possible for them to grow *Cymbidiums* as good as the hospitality they dispense, then the culture would be of so high a quality that criticism or even comparison would be out of the question.

In the first place I have long held the opinion that the enthusiasm of the majority of the Sydney growers is particularly keen. Quite a number have had the foresight to import quality plants whilst others have preferred to gamble on imported unflowered seedlings. Altogether, from what I have seen has suggested that, in my opinion, Sydney is the premier city of Australia as far as the culture of Orchids is concerned.

During the last four years I have witnessed a remarkable improvement in the quality and colours of the flowers, and the culture of the plants exhibited at the Sydney Orchid Shows which, besides being a tribute to the good judgment of the exhibitors is of benefit to Orchid growers generally.

I hope my impressions will be of some assistance to the gentlemen who conduct the unofficial meetings at Paddy's Markets on Friday afternoons where the latest in Orchids is keenly X-rayed.

Upon arrival in Sydney the first impression one gets is the number of plants which quite a few growers claim to possess, and which they personally look after in their limited spare time. Were some of these collections in a municipal park I should estimate that it would involve a full time job for two or more Orchid Specialists to attend to them, if the plants were to receive full justice.

Having too many plants is, I think, one reason why many growers obtain few flowers in comparison with the number of plants. I have no hesitation in saying that first rate Melbourne growers usually flower about 90 per cent. of their flowering sized plants. This I attribute to the individual attention which each plant receives. They are not packed close together on the benches thus permitting instant observation of any plant needing attention.

The foliage of plants grown in the open in Sydney is noticeably harder looking, shorter and often wind-frayed caused by the plants being too close together, and not sufficiently protected from the wind. Melbourne plants are grown under glass and consequently have a softer appearance, and usually grow longer foliage, and larger pseudobulbs than similar varieties in Sydney. This may have an influence on flowering, and also on the length of the spikes. Sydney appears to have a longer growing period than we have in Melbourne, but I consider that, to some extent this is offset by our glass-house treatment, which, when correctly managed, gives off quite a pleasant jungle atmosphere, resulting in very rapid growth. Furthermore, cold spells and winds are eliminated, thus preventing checks at various times during the growing period. This condition, I understand, often happens in Sydney, and must have an ill effect on the well-being of the plants.

I noticed that one very successful Sydney grower with a large glass-house had adopted the Melbourne methods, which inclines me to the belief that eventually glass will be used more extensively in Sydney. I also consider the colours of the flowers last better under glass, and they do not bleach out like flowers in the open. Many Sydney visitors consider our colour in general richer than theirs, but I venture to say that, if their plants were treated similarly to ours, their colours would be equally as good.

The sizes of the pots used by many Sydney growers are extremely large, one often seeing one pseudobulb, sometimes a "back-bulb," in an eight inch pot. Some growers have two pseudobulb plants in water mains three feet and over in diameter, which does not look correct to Melbourne growers, who grow on the average four and more large pseudobulbs in an eight inch pot, often showing two or more spikes during the flowering season.

Were Sydney growers to use glass-houses to grow their plants in, I am sure there would be a vast reduction in the size of the pots used with no reduction in the quantity or quality of the blooms.

It is not my intention to discuss compost for growing *Cymbidiums* in, as there are almost as

Continued opposite page

Grammatophyllum speciosum — "The Queen of Orchids"

J. GORDON SMITH, *Clayfield, Q.*

● The genus *Grammatophyllum* is rather a small one as is the range of its habitat, which extends from New Guinea to the Philippine Islands.

Grammatophyllum speciosum — known commonly as the "Queen of Orchids" because of the beauty of its flowers—is probably the world's largest Orchid plant. In its native habitat, which is Malaya, it is found in huge clumps which often cover many square feet. The species has pseudobulbs 3-10 feet long, and the flower scapes are 5 feet and longer, carrying many large flowers, the sepals and petals are ochre-yellow blotched with wine-purple, the lip is marked with red.

This genus for some unknown reason does not seem to be popular with Queensland Orchid growers, in fact, I have only seen two plants in all my travels in this State. They are both *Speciosum,* but unfortunately they have not yet flowered.

Recently a friend who had been working in Bougainville was advised to leave immediately for Brisbane, and he kindly thought of me and my Orchids, consequently I became for a short time the owner of two *Grammatophyllum* plants. Soon I had but one plant, the other having found its way into the house of that enthusiastic grower, Mr. Alf Hilsden; but for once honours were equal. Now we are both a little sad, because the plants have departed to the "great beyond." Perhaps in fairness I should say that both plants arrived in a bad state, possibly the coming of the Jap to Bougainville had upset them, or maybe they were bomb-happy. However, their troubles are over.

I have hopes, some day, of procuring a plant of *Grammatophyllum speciosum,* and after careful study of the subject of its growing conditions, I consider the following culture should produce results.

Culture. The first two essentials to be observed are (a) good drainage, as the plant is susceptible to dampness which rots the young shoots, (b) sun heat, as without sufficient sun the plant will not flower. As the plant propagates itself rapidly, it is best to start planting by selecting say two fully leaved and matured pseudobulbs out from the base of a clump. Care must be taken, however, not to injure the "eyes" at the base of the pseudobulbs. When a place has been selected in the garden, dig a circular trench, say 2 feet deep. Fill 6 inches of this depth with broken bricks for drainage, and the rest with good burnt earth mixed with dry cow manure. Ram the earth fairly tight and bring it to about 3 or 4 inches above the level of the surrounding ground. Dig a hole in the centre of the trench sufficiently large, and deep, to accommodate the plant comfortably up to the base of the pseudobulbs, keeping the "eyes" above the level of the soil. It thrives well in rich soil and, being a gross feeder, likes an occasional watering with liquid cow manure which develops and brings it into flower early.

(Continued from page 28)

many successful mixtures as there are men who grow them. *Cymbidiums* readily respond to care and attention, and for whatever is done in this direction, the grower will be amply repaid by many spikes of beautiful flowers, and if he is a Melbourne-ite, he will say, "It matters not how they grow them in Sydney, my way is good enough for me."

● ***Orchid Show.***—The Orchid Society of N.S.W. intends holding a sectional show for *Cypripediums* and *Cattleyas.* at the Austral Salon, Elizabeth St., on Tuesday evening, July 4, 1944. Members and their friends are cordially invited to attend, with plants in flower if possible. Arrangements are in the capable hands of the sub-committee, Messrs. E. A. Hamilton, W. Fahey, and W. Palmer.

● ***Annual Show.***—No general Orchid Show this year. The Committee of the O.S. of N.S.W. has debated several times the expediency of holding a general show in the spring, and has decided that it is entirely impracticable while restrictions remain on petrol and transport. Further, no central premises of sufficient floor space are available for the purpose. The floor space at Farmer's, Ltd. (1939) accommodated 630 plants, shown by 45 exhibitors, while at David Jones Ltd. (1940), space was provided for 470 plants shown by 28 exhibitors. There are probably fifty per cent. more growers now than there were when the N.S.W. Society held its last show.

The Germination of Orchid Seed

L. C. HOME, *Buranda, Q.*

As everyone knows, it is very difficult, at the present time, to procure new Orchid plants, and to overcome this difficulty there are two methods of increasing our stocks. The vegetative or asexual method is to cut the plant into suitable sections causing the "back cut" to send out new leads and thus produce another plant. The second method has recently been described by Mr. W. F. Adamson in his paper on "Hybrids and their Production." In this paper he gave the technique of fertilizing the blooms to produce seeds.

The present article will deal with methods for obtaining the maximum germination of seeds. When the seed has set and the seed pod forms, we have to wait for the seed to mature. The maturing is sometimes a slow process, and some varieties require as much as 12 months for the seed to ripen. When the seed is ripe the pod splits, and the seed spills out through the slits in the seed case. To prevent loss of seed when the seed is nearing maturing, it is advisable to place a cellophane envelope or bag over the pod, tying it on to the stem above the pod, so that when the pod bursts the seed which is spilt will not be lost.

When the seed is expelled from the pod it should be collected without delay, and either left in the cellophane envelope, or transferred to a small test tube lightly plugged with cotton wool. Orchid seeds deteriorate fairly quickly, and from work done in France in 1923, it would appear that after three months the seeds are apparently sterile and will not germinate. Moreover, according to most authorities the seeds from over 50 per cent. of the pods are not fertile, consequently, even with the best of technique, a large number of failures cannot be avoided.

The seeds of most plants carry sufficient stored up energy to carry them through their germination period, but Orchid seeds are not supplied with a sufficient reserve for this germination, and unless they obtain a further supply of food from either natural or artificial resources, the small seed will die of starvation. In nature, a fungus working in symbiosis helps in the germination of the seed by supplying the necessary food material to enable the germination to take place. The readily available supply of carbohydrates (sugars) appears to be the function of this fungus, so that when the fungus is not present, as in the case of a sterile medium, carbohydrates in an assimilable form have to be provided in the medium. Another function of the fungus is to maintain the correct acidity of the compost, and when the fungus is absent the pH of the medium has to be corrected to within narrow limits.

Having obtained the ripe seed, there are two methods of germinating the seed. The first being the rather clumsy and wasteful method of sprinkling the seed on to the compost of the parent plant. By this method some of the seed may germinate, but most of them will be lost, either by being blown away in the wind, or carried off by ants and other insects, or they will perish, due to lack of nourishment.

The second method is the germination of the Orchid seed on sterilized media consisting of the necessary plant foods contained in small flasks or test tubes. This method may be carried out in two ways, (a) symbiotic, and (b) non-symbiotic.

Treating the non-symbiotic method first; a solution is prepared of inorganic salts to give a readily available supply of nitrogen, phosphate, and potash. The nitrogen is usually supplied from ammonium sulphate or nitrate. Potash and phosphate in available forms may be obtained from potassium phosphate. Other inorganic elements such as magnesium, calcium, and iron are used, and chloride usually in the form of sodium chloride added. Carbohydrate, in the form of cane sugar, glucose, fructose or mannose is dissolved in the solution, and then agar-agar is added, and the solution heated until quite clear, and the pH adjusted to 5.2.

There are many formulae for nutrient media for germinating Orchid seeds. The medium I have found most useful for *Cattleyas*, *Dendrobiums*, etc., is that of Le Garde, and is made up as follows:

Magnesium sulphate, 1 gram; Calcium nitrate, 1 gram; Potassium di-hydrogen phosphate, 1 gram; Calcium chloride, 1 gram; Ammonium nitrate, 0.5 gram; Ammonium carbonate, 0.5 gram; Dextrose, 20 gram; Iron phosphate (colloidal), trace; Agar-agar, 15 grams—in 1 litre of water. (The English imperial gallon is about 4½ litres).

For the symbiotic method it is firstly necessary to prepare a pure culture of the root fungus, or Mycorrhiza. This is prepared from sections cut from the growing tips of roots from Orchid plants. The root tips are washed by lightly scrubbing with a soft brush, and then the outer tissues are sterilized by immersing in a very dilute solution of mercuric chloride, and rinsing in sterile water. The outer tissues are carefully removed by means of a sterile scalpel, and forceps, and sections cut from the inner tissues of the root. The tissues immediately behind the growing point are the best. These small pieces of tissue are then placed on sterile medium in test tubes and placed in an incubator. As foreign fungus is likely to grow in the medium it will be necessary to transfer colonies of the correct fungus to fresh tubes in order to obtain it in a pure state. When a pure strain is obtained, it is kept as a stock to inoculate the medium on which seeds are germinated.

A medium is prepared either similar to that prepared by the formula given above or made up of finely chopped fibres, impregnated with the necessary plant foods placed in flasks, the flasks being plugged with cotton wool, and sterilized in an an autoclave, and then allowed to cool. The sterile medium is then inoculated with the pure culture of the fungus, and set aside in an incubator for a few days, it is then ready to receive the seed. Before the seeds are placed on the medium they have to be washed in a sterilizing solution to remove any foreign fungus which may be on the outer skin of the seed. This is done by washing the seed in a solution of calcium hypochlorite (bleaching powder), 10 grams of calcium hypochlorite being added to 140 ml. water, then filtered, using the clear filtrate. Treat the seeds for 5 minutes.

H. Castle and L. G. Nickell, writing in the Bulletin of the American Orchid Society, say, "Complete sterilization of Orchid seed, without injury, was achieved by the transference of a sufficient quantity of seed for one or two germination flasks to a sterilization tube by means of a small platinum loop, washing the seed to the bottom of the tube with three drops of aerosol solution (prepared by adding one drop of 25 per cent. O.T. clear aerosol to 25 ml. water), adding three drops of freshly prepared calcium hypochlorite solution (obtained by digesting 2 gm. of the compound in 28 ml. water for ten minutes and filtering), and stirring occasionally for five minutes."

The seeds are then placed on the surface of the medium in the flask by means of a sterile platinum loop, and the flask stoppered with a cotton wool plug, and the flask contents set aside in an incubator until there is a distinct colour of green showing. The flasks may then be placed in full light, but not in direct sunlight, until the young plants are sufficiently advanced to be placed out. The operation of transferring the seeds to the flasks must be conducted in a transfer chamber. This is a small room hermetically sealed, and, previous to working, the room is sprayed with mercuricchloride solution to ensure that during transfer no foreign fungi will enter the flasks; also all instruments, etc., used must be sterilized.—9/11/43.

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● ***Pterostylis longipetala,*** a new species described by H. M. R. Rupp in the Proc. Linnean Society of N.S.W., Vol. LXVIII, 1/2, 1943. Found at Bateman's Bay, N.S.W., (the type) 6, 1931, E. Nubling; also near Huskisson, Jervis Bay, N.S.W., 8, 1942, F. A. Rodway.

● Membership subscriptions to the Orchid Society of New South Wales for 1944-45 are now due, and payable to the Hon. Treasurer, Mr. J. Bisset, 48 Wareemba St., Abbotsford, N.S.W. **Members in arrears are requested to post their remittances by return mail.**

● ***Australian Orchids,*** a new book. The Orchids of New South Wales, by the Rev. H. M. R. Rupp, B.A. (Melb.), issued from the National Herbarium, Sydney, as a part of the flora of New South Wales. December, 1943. 168 pages, including 24 full page illustrations. Price, 9/- net, cloth binding; 6/- net, paper binding. Postage, 6d. within the British Empire; 1/- foreign. The arrangement followed in this book is primarily designed to meet the needs of taxanomic botanists, and follows well-established precedents for the format of a flora. It will also be of great interest and service to a much wider field of naturalists and students, and to the many who are interested in the growing of Australian Orchids.

Artificial keys to the genera and species provide a ready means of identifying the plants. The family is critically reviewed and each species is fully described and the relevant references to literature and synonyms made. The distributions are given in detail, and notes of general interest are supplied. In an introductory chapter the author explains in simple terms the fundamental structure of the Orchid flower and comments on the history of Orchidology in Australia. Notes on the collecting and habits of Orchids will help anyone about to take up the study of this family. Some of the species are illustrated in the twenty-four full-page line diagrams.

● The Rev. H. M. R. Rupp, in his recently published book on the Orchids of N.S.W., has given the student of field orchidology and ecology, the book he has been waiting for. The prodigious amount of work put into this book is surprising, practically every aspect being covered. One important feature is the revision of the nomenclature, which has been brought up to date. Mr. G. V. Scammell's line drawings are a treat to examine, the student regretting that the present times debar the reproduction of more of them, so therefore, we must be thankful for these small blessings. As Mr. Rupp says, "There has been much diversity of opinion in regard to the best order of arrangement of Orchid genera," but it may puzzle some students why dissimilar genera have been lumped in the subtribe *Caladenieae,* the genera *Acianthus* and *Calochilus* seemingly having no rightful place there, the "lumping" under the sub-tribe *Diuridae* may be equally puzzling. These remarks are by the way, for Mr. Rupp is to be complimented on a measure of work that fittingly crowns a long and energetic life in the interests of Australian Orchidology. A check-list of the Orchids of Australia seems to be a logical sequel to Mr. Rupp's research in New South Wales, and that of specialists in other States. Perhaps the C.S.I.R. would be sympathetic towards such a publication.

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AUSTRALIAN ORCHID REVIEW

Volume 9 **SEPTEMBER, 1944** No. 3

The author of each article is responsible for the facts and opinions expressed therein.

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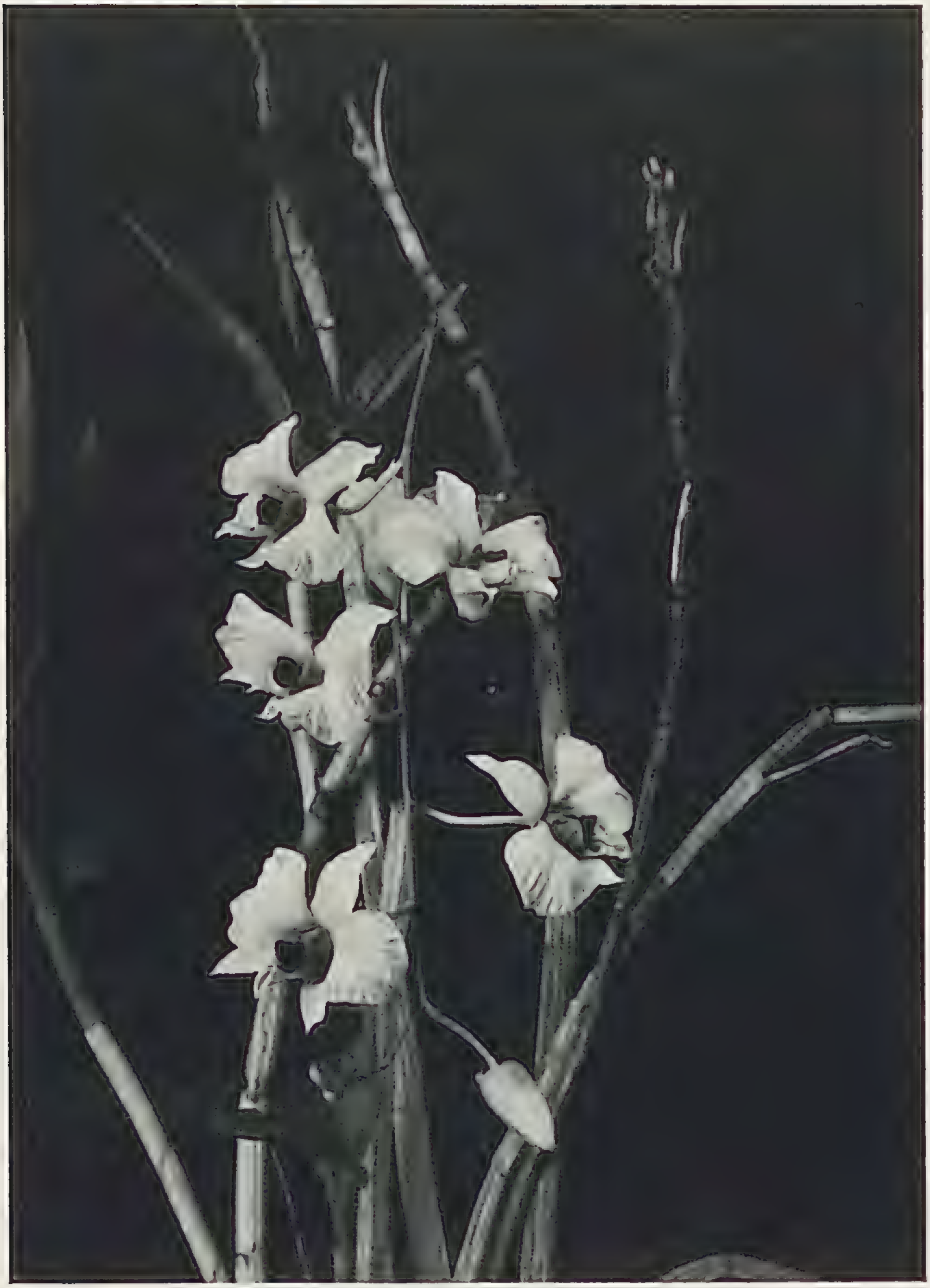


DENDROBIUM PHALAENOPSIS, *var. W. Paton*
Exhibited at the May meeting of the Queensland Orchid Society.
Photo. Dept. Agriculture and Stock, Brisbane.

A new variety of Dendrobium Phalaenopsis (*Fitzg.*)

C. T. WHITE
Government Botanist, Brisbane

● The extraordinary variety of *D. Phalaenopsis,* illustrated in the accompanying photograph, was grown by Mr. W. Parton, of Brisbane, and exhibited at the May meeting of the Queensland Orchid Society. It has the growth of *D. Phalaenopsis,* but the colouring of the flowers reminds me more of *D. dicuphum,* common in the Northern Territory, and islands of the Gulf of Carpentaria. The petals have the convex or rounded shape of *D. bigibbum.* The plant was received by Mr. Parton among a bundle of *D. Phalaenopsis* from North Queensland, though he does not know exactly where they were gathered. The labellum is sharply pointed, and like *D. Phalaenopsis,* has no plates or calli running down the centre.

In discussion, Dr. D. A. Herbert suggested that the growth and colouring might be due to a virus acting in a similar manner to that causing the "Rembrant" race of Tulips. I hesitate to name the present plant as a botanical variety, but it is capable of vegetative propagation, and will probably come into cultivation to some extent, so may be described as follows and called—*Dendrobium Phalaenopsis* Fitzg. var. "W. Parton."

Growth of typical *D. Phalaenopsis.* Flowers 4.5 cm. across. Sepals whitish very faintly suffused with mauve, slightly darker at the base, 1 cm. across. Petals convex, whitish with a very pale lilac tinge, streaked at the ends with short broad bands of lilac, tending as they die off to become violet throughout, 2cm. across. Labellum very sharply pointed, lateral lobes (middle part) deep shining purple, end lobe white streaked with lilac.

The colours used are those of the "Repertoire de Couleurs" published by the Societe Francaise des Chrysanthemistes. Unfortunately the accompanying photograph does not show the colouring to advantage.

● *The Q.O.S. June Meeting.*—The outstanding exhibit was that of Mrs. A. Scott, whose *Vanda coerulea* carried forty-four magnificent blooms on four racemes, and was the envy of all those who saw it. Mrs. Scott kindly gave a brief address on her method of culture of this plant, and stated that periodical doses of liquid cow manure were applied regularly during the growing season.

● *Vanda coerulea.*—"On the 10th September, 1939, I bought six plants of *Vanda coerulea* and petted them with but slight variation of potting conditions. They all flowered the first year, and then proceeded to lose their leaves and put forth little knobby roots, as is unfortunately usual with this plant under our conditions. Two plants were particularly poor. One had only two leaves at the top, and the other had lost all its leaves, but had put out a weakly side shoot. With the idea of "kill or cure," I placed about three inches of freshly dropped cow manure (about three days old), up to the top of the pot of each of these two plants, and waited without much hope for some months. In the meantime the other four plants died. The first plant retained its top leaves and started to send out strong side shoots; the second has sent out side shoots which appear quite healthy, and I think will grow eventually into a sound plant. The roots stopped their "knobby" effect, and are tending towards the long and healthy in both plants, and No. 1 is about to break into flower. I renewed the cow manure yearly. I may be forgiven for expressing the hope that the above may be the answer to growing this species."—W. McK. Robertson, Mt. Gravatt, Brisbane, June, 1944.

● *Orchid Culture in Ceylon* is the title of a book recently published by The Orchid Circle of Ceylon. As the result of the collaboration of numerous authors, this book has been compiled for the humane purpose of helping the Ceylon Division of the Red Cross Society, and for that reason is beyond the sphere of literary criticism. The "Orchid Culture in Ceylon" is so liberal in the presentation of coloured and monochrome illustrations, and in the wealth and variety of articles—the chapter on "Manures for Orchids" is, in itself, almost worth the price—that even in normal times the critic would be hard put to in faulting in. It is a valuable addition to any Orchid library. The price is £1/5/- sterling, payable by money order, and is obtainable from The Orchid Circle of Ceylon, c/o Dr. E. Soysa, 32 Barnes Place, Colombo, Ceylon.

● Back numbers of the Australian Orchid Review are still available, excepting nine issues, which are Vol. 1, Nos. 2 and 3; Vol. 2, No. 1; Vol. 3, No. 3; Vol. 4, Nos. 2 and 3; Vol. 7, No. 2; Vol. 8, No. 2; Vol. 9, No. 1. Copies of Vols. 1 and 2 are priced at two shillings each, Vol. 3 one shilling and ninepence each, and all subsequent issues one shilling and sixpence each.

Limiting Factors of Orchid Culture

Dr. D. A. HERBERT, D.Sc., *Queensland University, Q.*

An Orchid is like any other plant, in that it grows and flowers best under a special set of conditions. Each year it goes through a cycle of development. A spring flowering *Dendrobium,* for example, may put out its new leads in early summer, grow through the warm months, and in winter slow down and apparently go to rest. Actually it does not rest; it may not be growing, but the internal activities are considerable. Chemical changes are going on in its stems, and before the cold weather is over, the appearance of buds shows that the plant has been far from dormant. In summer, it has been accumulating the food materials that it marshals into flowers by slow degrees during the winter. Visible flowering may cover only a short period, but the preparations and the culmination take twelve months. During those twelve months many things may happen to interrupt the sequence, and perhaps to prevent the final production of bloom. A plant starved or desiccated early in its growing season may be unable to build up the necessary food capital. Bad lighting may not prevent growth, but it may mean that no reserves are on hand for the internal activities that precede flowering.

On the other hand, a plant that has had the right conditions during the growing period may have such an accumulation that it takes the most flagrant ill-treatment to prevent it from flowering. How often have we seen a case of imported Orchids opened up to reveal the dry stems in full flower? It is doing that on the strength of food capital accumulated months before in a far-off country. If such plants flower a few months later instead of on the journey, the same conclusion is valid. The Orchid cannot be considered to have been successfully flowered unless it does so for several seasons, and maintains good growth meanwhile.

We know from our collective experience in The Queensland Orchid Society, that there are certain Orchids which regularly behave in an unsatisfactory manner. It may be that our weather sequence is wrong for their developmental sequence. But there are some which grow well for certain growers and fail with others. It is these erratic species that often mislead people into thinking they have discovered the secret of growing them, simply because under their cultural conditions one particular treatment gives outstanding results.

The crux of the whole matter is this:—Orchids grow best under a special set of conditions covering not only temperature, light, water, food and freedom from disease, but also variations in temperature, light, and water from season to season. If any of these are unsatisfactory the plant may fail, no matter how favourable the others are, and with different growers, conditions vary so greatly, that no one explanation can be applied.

Let us consider *Dendrobium undulatum,* the common "Golden Orchid" of the north. In North Queensland it grows in all sorts of situations—on trees, on rocks perhaps often sprayed by the sea, and even in sand. No one could claim that it is an advantage to it to be sprayed by the sea, but everything else is so much to its liking that it thrives. But as we come south, or as we ascend the northern mountains, the Golden Orchid peters out; the temperature has become unfavourable. If all other conditions are satisfactory it will grow well in Brisbane in cultivation in spite of the cooler climate, but if other unfavourable circumstances are added its life becomes a burden, and it fails under treatment that it might easily survive in the north. The possible additional handicaps might be poor lighting, inefficient water supply, inadequate food or perhaps pests and diseases.

Suppose a Golden Orchid is going back in a bushhouse but starts to grow well when put in the full sunlight. The deduction might be made that all that is required is a sunny position—that good lighting is the secret of its successful cultivation. But the explanation is that the lighting was the main thing wrong in that bushhouse. Perhaps some other grower has a compost that is of little food value, and finds his plant responds wonderfully to a little blood and bone; feeding is the solution of his problem. Another finds the pH needs adjusting; some of our members are always at "Home" on this subject. These are all individual methods of improving conditions, and probably the correct ones for particular locations. But the fact that one grower gets over his difficulties by altering the lighting, another with fertilizer, and another with a special routine of watering, implies that the requirements of the Orchid are manysided. What is necessary in cases of unsatisfactory growth is to check over all these factors, and not to plump blindly for one on the basis of someone else's experience under different growing conditions.

Orchid Culture

J. GORDON SMITH, *Brisbane, Q.*

● Much has been written regarding Orchid culture, and doubtless much more will be written by people better versed in the subject than myself. In my talks with Orchid growers in various parts of Queensland, I have found that most growers have their own methods of potting, which suit their conditions and give good results. These methods have been tried by other growers, who are desirous of improving their plants, and while they claim to have followed the instructions in every detail, fail to get the same results.

This is where the grower is called upon to use his common sense, for having potted an Orchid in the best compost procurable does not necessarily mean that he will grow it. Light and atmosphere are all important, and when he succeeds in getting all three correct, then he is reasonably assured of good growths and consequently good blooms.

While most Orchids require plenty of light, very few can stand the direct rays of the sun, which will burn the leaves and disfigure the plants. A house which does not get sufficient light will produce only weak growths which very often fail to bloom; also, the plants are subject to attack from all manner of pests.

Consider for a minute the way in which most of us grow Orchids. We have limited space available, probably one house. We put *Dendrobiums* over there, *Cypripediums* here, *Vandas* down there at the end, *Cattleyas* somewhere else, while odds and ends such as *Aerides* are hung up. All get the same light, sun, rain, and temperature, and, yet we get blooms. I even tried to grow terete *Vandas* in the same way, simply because I knew no better. The plants grew, but would not bloom. One day a friend told me that he had flowered a *Vanda teres* ,but the plant had worked its way through the covering on the roof into the open sunlight to do so. At the time we were buying plants from the late Carl Schmidt, and I mentioned the matter to him in one of my letters. He soon put me right, and now my "teretes" are grown in the open garden, where they grow well, blooming regularly and profusely.

I am now going to try and show you what light and atmosphere mean to Orchids. The genus *Dendrobium* is an excellent example, because of its very wide range of distribution. You are all doubtless aware that this genus extends from Tasmania, through Victoria, N.S.W., Queensland, New Guinea, Java, Philippine Islands, to Burma, North India, China and Japan. With such a vast range of distribution, it naturally follows that the growing conditions must differ considerably; consequently we find that we can only grow about half the known species.

One classical example being our beautiful native *Dendrobium Tofftii.* This species has been found in its wild state, growing within a 1,000 miles of Brisbane, but so far we have been unable to grow it successfully. Possibly the longer hours of sunlight and the longer period of humid weather all play an important part in the life of the *Dendrobium.*

The genus *Vanda* is another good example, and, while its range of distribution is not as vast as that of the genus *Dendrobium* we come across a very good idea of how difficult atmosphere can be. We find that such species as *insignis, Luzonice, tricolor, sauvis,* and *Sanderiana,* and the Terete group do well with us, but we come up against "a snag" in the beautiful *Vanda coerulea.* This species is found in the Khasia Mountains in Assam, growing on oak trees at a height of 4,000 feet above sea level.

You will notice that I have used only species to explain light and atmosphere, for in *Dendrobiums* and *Vandas* it is mostly species that we grow. It would appear that it is at present, beyond us to produce the conditions required by *D. Tofftii* and *Vanda coerulea.*

Here I must change from species to hybrids, for I consider if safe to say that not 5 per cent. of the *Cattleyas* grown are species. Most of the *Cattleyas* and their crosses, whether *Cattleyas, Brasso-Cattleyas, Brasso-Laelia-Cattleyas* or *Laelia-Cattleyas* have been crossed and raised in England, for that is where most of our seedlings have been purchased. It is generally accepted in most cases that the hybrid is the stronger plant. This is reasonable as the stronger characteristics of the parents usually predominate in the seedlings. Thus we find that the hybrid raised in captivity and grown on will bloom profusely. As an example of the hardiness of the hybrid, I mention *Vanda x Gilbert Triboulet* grown on from a small seedling by one of our growers, and year after year its growth increases, and it blooms profusely.

Culture is a very open subject, and one that offers immense possibilities. The wise Orchid grower can always learn, and so add to his experience for the good of his plants.

Extracts of Fact and Fancy from a Diary

F. DOUGLAS, *Mosman, N.S.W.*

● Green flowering *Cymbidiums* have an appeal, an attraction, a "something" which captures my interest and desires, and *grandiflorum* is as good as most hybrids, but in Sydney little success is attained in flowering it. Its difficulty of culture is a challenge, and its price, when imported direct, an invitation.

December, 1939: Received from India a consignment of *grandiflorum* and *giganteum*. On opening the baskets with the usual doubts, expectation, and excitement, a sad and sorry sight was disclosed. The pseudobulbs were small, shrivelled, almost black, and quite insignificant in comparison with the bulk of dead roots, not a green leaf was to be seen, all were as brown and dismal as the thoughts they inspired. Cutting away all roots and leaf bases with a sharp scissors and washing them with a strong jet of water, it was seen that the buds at the bases of the pseudobulbs were showing signs, at least of being alive, if not of life.

The only redeeming feature about the unimpressive lot was that they had made no attempt to grow, even some of the old rhizomes extracted from a mat of roots and decayed pseudobulbs had live eyes. They were cut into portions consisting of 4-5 pseudobulbs and almost as bare of roots as an egg. With other "backbulbs" they were set on moist Sphagnum moss, outside in the shadow of a wall.

January, 1940: Left in that position and condition, it was surprising how the old pseudobulbs filled out and lost that emaciated appearance. The most pleasing feature was the extraordinary number of buds showing signs of being alive and growing. Two eyes to every pseudobulb, and an odd one with three, even the bulbless rhizomes were definitely producing growth. The *giganteum* were further advanced than the *grandiflorum*.

February: First impressions that they were of little or no value endured and perhaps encouraged an experiment with potting materials. They were set in the garden in practically a full sun situation, there being neither a tree nor a bush-house. An endeavour was made to divide each variety into six equal groups of equal sized plants. Each group was potted with a different material. They were potted into 5 inch pots, liberally crocked with old pots, charcoal, and a filter of moss. No. 1 group had Sphagnum moss only. No. 2 group had old leafmould only. No. 3 group had coconut fibre only. No. 4 group had peat moss only. No. 5 group had cow manure only. No. 6 group had test or check. A compost open and porous, consisting of a mixture of approximately the same materials with charcoal and crushed crocks. One part of each. I could have used Staghorn, hops, turf, loam, garden soil, Banksia or Todea fibre, wood ashes and sand. Weather hot and dry. Watered freely.

March: All appeared promising. *Giganteum* had the better growth. Variation in the growth of different groups apparent. If any difference, it was with the better growth on No. 1, followed by Nos. 6, 3, 4, 2, and 5 last.

Veracity compels recording the fact that from now onwards they receive a periodic application of their established kims medicine. Call it what you may, dope, water softener, or mollifier. Merely an infinitesimal solution of whatever is on the shelf. Hertomone A, atmospheric nitrogen, Vitamin B, nicotine 40, lemon juice, vinegar, sugar, magnesia, caustic soda, corrosive sublimate, sulphate of ammonia, and liquid cow manure. One at a time and except the cow manure and Vitamin B, once only in about two years. One cannot feed or force Orchids and get away with it.

April: March impression confirmed. *Giganteum* apparently sitting tight. *Grandiflorum* lively.

May: One pot of each species "gave up the ghost," being the residue of the forlorn hopes, they may be ignored. The manure was evidently too much for them. Range of growth—from ½ inch to 1 inch on the manure, and up to 4 inches to 5 inches on the Sphagnum at the other end of the scale. A peculiar feature disclosed was that although each pot had approximately six live eyes when potted, the Sphagnum, although producing the best growth, had confined its energy to one or two leads, the other eyes remaining dormant. The manure and leafmould had from 4 to 6 leads, neither of them with any appearance of strength. The peat and coconut had from 2 to 4.

June: When one looks at the stars or the moon earnestly and intently they will be seen to move, and so it is with young leads on *Cymbidium* back-bulbs, with the movement confirming previous tendencies. Curiosity concerning the roots could only be satisfied by turning them out to find the answer. Hence in the belief that all plants benefit from a repotting when care and judgment are used, they were repotted in the same material and the intriguing condition disclosed that the roots and vegetative growth did not balance. The leaf-mould had the most numerous roots, followed by the manure, the least peat-moss, coconut-fibre, and last the Sphagnum. The *giganteum* had scarcely a root at all.

Pots were all washed and re-crocked previous to repotting loosely.

All plants in Sydney seem to resent a firm, compact rooting medium, and so do Orchids. Literature and advice notwithstanding, one cannot firm or ram an Orchid root and still have the root. The disclosure certainly has provided food for thought. In propagating bulbs or general nursery stock it is the root which counts, hence, will the unbalanced roots of those in the manure and leaf-mould subsequently produce growths which will outgrow the unbalanced vegetative growth of the Sphagnum? Generally in propagation when vegetative growth precedes roots it is taken that the temperature is too high, atmospheric moisture is excessive, or a combination of each.

July: The repot not apparent, growing, but only just. Liliums planted between rows so as to provide a protection from the hot sun and winds of summer. Alternately the plants or pots will provide a ground shade and moisture for the Liliums.

August: Evidently taking a rest.

September: Ditto with dots. If anything a firming up in the texture, an attempt to form a bulb at the base of the insignificant growths.

October: The *giganteum* definitely moving out of their state of arrested animation, looking really good, but with hardly a root to their name. The *grandiflorum* groups seem to be evening up, young growth apparent, breaking from the dormant eyes and in one or two cases even from the base of the insignificant growth, one could scarcely call them pseudobulbs.

The check and Sphagnum groups are about equally the best, although the check has the runaway pot. The mould comes next, then the coconut and peat about equal, with the manure last. First root through the bottom of the pot is marked to the peat-moss, perhaps it is only trying to get away from it, or trying to get something else.

A return to the hot weather with the water restrictions makes one anxious, uncertain, and interested, hence, they are well plunged, worms cannot easily block a properly drained pot and one thorough watering a week should do them with a sprinkle from the rose or syringe daily. When one thinks of it, would not an experiment of different forms of watering be interesting and instructive. Say, one group watered by immersion only, one group with the usual but now prohibited hose, one by water-can, one with rosed water-can, and one group by syringe. Would they all grow alike, and if not, which, what, why?

November: *giganteum* continuing to increase the size of previous growths, but no new leads breaking. Repotting shows surprisingly few roots, each material has good, bad, and indifferent.

Grandiflorum appear to be realigning themselves but not consistently, some sitting, few standing, others bolting. Repotting shows very active roots, almost balanced in each material. Spaghnum must have jumped. Manure and mould very "puggy" with the tips of some roots dead and decayed. They received fresh material with crushed crocks, and charcoal incorporated as an opening medium. Anyway they have proved that *Cymbidiums* will, and can, take either pure unadulterated cow manure or leaf-mould without leaves, naturally harm has, and will accrue when permitted to become a pug.

December: Twelve months since their arrival in sunny Australia. *Giganteum* apparently resting again. Vegetative growths on all pots fairly equal, average—two strong and one weak lead per pot. All original growths. Roots commencing to show themselves. *Grandiflorum*, also resting. Fairly equal growth, average four and one per pot, few pots with all original, others with original and subsequent. Roots good.

January, 1941: *Giganteum.* Vegetative growth stationary. Roots active and good.

Grandiflorum similar, both may be putting on weight below the basal sheaths. Satisfied that in this position, and environment, and under the treatment given—that the potting medium is only of secondary importance. On the other hand, it could become a dominating and primary factor if permitted to become a pug, waterlogged, too dry, too hot, or contain too much lime, artificial mineral or chemical manures. If this is so, one may use as, or in a compost, any of the decomposed recognised vegetable materials,—staghorn peat, brewers' hops, old turf, Banksia fibre, Todea fibre, Osmunda fibre, wood ashes, tan-bark, moss, Spaghnum moss, old leaves, leafmould, coconut fibre, peat-moss, cow manure, or good garden soil, with crocks, charcoal, bush or sharp sand as openers or aerators. Horse manure is suspect, crushed bones is the only safe artificial manure, although they may take traces of others with or without benefit, with or without harm.

Porosity is a necessity. Drainage in each case has to be perfect, otherwise that unsightly black spot or rot will find a happy hunting ground. If cow manure is to be the medium, it would require an exceptional proportion of crushed crocks or sharp sand to keep it open, under and according to the conditions to which the plants will be subject, for instance, when the pots are comparatively large in size, or are to be set on, or plunged in soil, the mixture should be very open, whereas when pots are medium, or are upon ashes or boards, it need only be of an open nature. When pots are small, or set upon an open bench, a comparatively compact condition may be quite satisfactory.

The habit or temperament of the grower is another factor which requires consideration and should affect the decision as to what particular degree of openers or compactness will be used. Most beginners overwater and coddle, therefore, comparatively small pots, and a very open mixture set on open staging are necessary to counteract the keen enthusiast's natural habit. In other words: The texture of the rooting medium should be determined with a view to counteract—or balance the local conditions of light, heat, moisture aspect (sunny or shady) situation (exposed or protected, not spot or funnel, air circulation), size of pots, type of staging and habit of cultivator.

February: Nothing to report. No apparent growth, but all looking like nice, healthy promising young *Cymbidiums*. The hot Saturday did not affect them, quite unshaded (103 deg. in shade, ? sun temperature). Sun and shade temperature are almost equal when over the century, as a rule, because of the haze. Not so this time, it was all sun heat, and minus the haze, dust, and dry westerly wind, which burns shaded and unshaded plants. Established plants in the open could not take it. *Giganteum* first to burn, followed by *Traceyanum*, *grandiflorum*, and *Lowianum*. *Lowio-eburneum* was not affected. Cutting off the burned portion of the leaves the following week it was noticed that the small basal leaves had also turned yellow and in most cases embryo flower or leaf buds were protruding or enlarged. This may be purely seasonal, although it certainly appears to have received added impetus from the scorching.

March: *Grandiflorum* very promising, bulbs formed and numerous leads coming away. What looks like the first flower spike is to Sphagnum moss and the runaway test, neither on largest bulb. Roots exceptionally good. Leafmould and manure sinking into drainage and forming a pug when wet. Spaghnum rotting, most roots on Spaghnum. Potted into 7 inch (except runaway, which was shifted into 8 inch by 9 inch wicker basket).

The larger pots compel the inclusion of crushed crocks and charcoal as opening material for the mould, manure, and Sphagnum, and so they lose their individuality and come to a compost. 4-6 lead plants are too large for 7 inch pots if each lead requires ample root run, therefore several were divided. Now I think it is a mistake not to commence with single bulbs or perhaps two, if bulbs are very old, very small, or in very poor condition. Starting off with a nest of backbulbs may help them to shoot strong or quicker, but the resultant plant requires too large a pot when at the flowering stage.

Giganteum not so good or equal, few forming bulbs, one or two with one strong lead. After a shower of rain the original Indian bulbs filled out to full size. Uncertain if this occurred overnight or has been so gradual over the past year that it escaped notice until a *fait accompli.*

April: *Grandiflorum* in action, roots, bulbs and young leads. Flowers turn out to be extra strong leads.

Giganteum irregular but promising slowly.

Adjacent plants have thrips and brown, white and stock-seed scale, and in the soil are snails, slugs, woodlice, ants, and crickets, hence a thorough overhaul, a spring cleaning, all leaves and bulbs sponged with an insecticide cloth. Spraying does not clean the dust and smut. It is all right as a preventative, but not recommended to either clean or cure. Pots washed and dipped in weak nicotine 40. Meta fuel mixed with bran is a bait for slugs and snails, and a poison none can resist. The woodlice, ants, and crickets move when moved, therefore a thorough, conscientious, systematic cultivation, and cleaning of the surroundings, followed by laying baits of sugar and borax, bran, sugar and paris green.

Williams states in his Orchid Growers Manual that "more Orchids are lost as the result of uncleanliness than from any other cause," and it is a fact that one never sees a collection of plants or Orchids in an unhealthy condition when the foliage is consistently sponged, and containers and surroundings are kept clean.

May: *Grandiflorum* looking in prime condition. Roots, foliage and young leads. Two leads from each bulb, growth certainly very slow. Coconut falling behind, opening material added.

Giganteum good but irregular, few young leads with exceptional strength, roots now active.

Sprayed and watered with oatmeal water and ditto from wheat to check up on Vitamin B, and to comply with water restrictions.

June: Grandiflorum, while they live they grow, but, ye Gods, it may not be observed between one month and another.

Giganteum, if anything, young leads equalising, could hardly be described as active. Weather wet. One watering sufficient for the month. Beetroot water.

July: Grandiflorum, roots active. Young leads strong, but, oh, so slow. *Giganteum* ditto, great appearance of strength on young leads.

August: Grandiflorum appear to be taking a rest. Root action stopped. Check. Injury or mutilation hastens maturity in plants. Perhaps this is the season to attempt an artificial stimulus to the latent flower bud, eye or cell due to open in approximately 12-13 months.

Giganteum moving, but only just.

Domestic water compulsory—so tea slops, weak.

September: Grandiflorum definitely resting.

Giganteum may be moving but, by cripes, they are slow.

Cabbage water.

October: Grandiflorum vegetatively stagnant, but roots re-commenced to move.

Giganteum very similar.

Believe that the subsequent continuation of growth apart from enlarging or forming a bulb also actuates the latent flower or leaf eyes at the base. Could they be like tigers in the Zoo! When well fed and healthy they do not reproduce.

November: Grandiflorum, resting, roots active, but no apparent vegetative movement except the basal buds which are enlarged or protruding.

Gig., irregular growth and roots.

January, 1942: Grandi. and *gig.* both resting vegetatively and perhaps also at the roots. Growths in good condition and should fill out in due course to full sized matured bulbs.

Their emergence from a state of rest is awaited with interest.

February: A shower of rain and overnight the *grandi.* have commenced to form pseudobulbs at the base of the young growths, concurrently with a discolouration or shrivelling up of the basal sheaths and a few leaves on previous bulbs. Definite movement of the basal eyes. Rapid growth of roots. Most pots with roots emitting or prominent at the pot hole. Test by far the best, other groups fairly equal. Repotted some into 9 inch tins and tubs, divided a few. Material brought to resemble test.

Gig., no apparent vegetative movement, but roots active.

March: Grandi., commencing active growth. Buds stretching upwards. No flower spikes this year apparently. Previous growths enlarging to fair sized bulbs. Old bulbs losing foliage, roots running.

Gig. stay put. Growths perhaps commencing to swell and thus form bulbs.

April: Grandi. bulbing up. Few strong leads, remainder offering. Basket best, others more or less equal.

Gig. not so far advanced but growths forming full sized bulbs.

Topping up and sponging. Few scale here and there.

May: Grandi. roots and young leads active. *Gig.* bulbs almost full size. Few with flower spikes showing, but no young leads.

June: Grandi. evidence of strength on young leads which are equalizing. Roots running.

Just wondering if *grandiflorum* should be set in sunniest and warmest position during winter, say from March to September, shade and dry off from October to January, commence watering and stimulating about Christmas.

Gig. few in flower, some with two spikes from one bulb and very nice, too. Young growths just showing, fairly equal and exceptionally plump.

July: Grandi. leads advanced to stage when four to six leaves about 6-8 inches emerge from sheaths which are losing their chlorophyll greenness. Roots appear to be slowing up in harmony with the leads.

Gig. flowers don't last. Roots and leads moving.

August: Grandi. resting if not equalizing. Eyes discernible at base of new growth? Flower or growth for 1943. So flowers on *grandiflorum* are determined more than one year before bloom. This is August, that means during May, June, July (winter), so they would need all the sun and heat then. Will try it next year.

Gig. all flowers finished. Young leads jumped.

September: Grandi., all young leads equalized, almost resting roots active.

Gig., young leads moving equally and apparently strong, roots moving.

October: Grandi., vegetative growth very slow. Roots moving.

Gig., growth good strong, and active with roots in like condition.

November: Grandi., growth and roots apparently resting. At least two eyes enlarging at base of young growth. If they are flower spikes in the young stage it means that they are developed in embryo in the proceeding months and during growth. Consequently if an attempt is to be made to force them to flower it would require to be practiced during that period. Mutilation, injury, or a check hastens maturity or flowering, but what prevents natural maturity, dryness would be a check or injury and hasten flowering. With our humid atmosphere and an occasional watering it is hardly possible for them to be dry during winter. Can it be insufficient heat or light or a combination of the two. Must provide more of them in winter before essaying a change in moisture and medium, or attempting decortication, starving, root pruning, or checking by an overdose of water, manure or lime.

Gig. growth exceedingly slow, but roots still active.

December: *Grandi.* vegetatively resting, roots moving after copious rain. Slightly burned when dry. 100 in shade, no wind. Flower spikes moving.

Gig. growing, primary growth almost completed, roots active.

January, 1943: *Grandi.* vegetatively resting, roots active. First flower spike confirmed on runaway plant. Test or check material and grown in basket. Badly scorched 100 deg. in shade, with westerly wind.

Gig. vegetative growth at primary stage resting, roots active, slightly damaged.

Plants set up on tub and on bricks not scorched. Ye Gods! tomatoes on the ground will damage, if staked they are safe. Hence I may not need a bush-house with its disadvantages and advantages, but need only raise my *Cymbidiums* off the ground.

February: *Grandi* still resting. Another spike confirmed. 10 buds emerged from first spike sheaths. Potted into tins. 99 in shade.

Gig. resting, but basal buds may be enlarging.

March: *Grandi.* suggestion of movement.

Gig. almost resting. Number of flower spikes just discernible. Dry and fairly high temperatures.

April: *Grandi.* young leads breaking freely and strongly. Flower spikes losing buds. Number set up to full light, heat and air, will require more frequent watering.

Gig. flower spikes numerous and stretching. No leads. Potted on. All foliage sprayed and pots washed. It always seems to stimulate and encourage growth.

May: *Grandi.* in active growth, leads strong, fairly equal and numerous.

Gig. flowers mostly open but small and dark. Non-flowerers showing strong leads.

June: *Grandi.* growing well.

Gig. flowers past. Few leads showing. Exceptional rain.

July: *Grandi.* growing slowly.

Gig. apparently resting. Few strong leads showing.

August: *Grandi.*, cripes, they are slow. Extremely cold weather.

Gig. sitting tight.

September: *Grandi.* primary growth almost completed.

Gig., young leads just showing.

October: *Grandi.* growth stationary, roots running, risking them set up to sun.

Gig., young leads strong, roots active.

When water restrictions were on, about one watering a week was ample, now, when I can use a water tap they appear to need it two or three times per week. How adaptable plants are. With unlimited water can I avoid making them require it every fine day?

November: *Grandi.* leads equal and resting, roots indefinite.

Gig. leads strong, moving slowly, roots active.

December: *Grandi.* looking well but resting, roots ditto.

Gig. leads and roots moving.

To be continued.

● ***A Queensland Visitor.***—F/Lt. J. McG. Wills, of the Air Training Corps, and a member of the Q.O.S., has been through a course at Bradfield Park, and during his leave he energetically "breathed" the Orchid atmosphere of Sydney. He was present at the June meeting of the O.S. of N.S.W., the President, Mr. E. A. Hamilton, extending a welcome to him on behalf of the Society. Mr. Wills also visited the sectional show held on July 4, expressing his admirations of the fine show of *Cypripediums, Cymbidiums,* and other kinds. In the brief time at his disposal, he was able to visit a few private collections, as well as commercial ones.

● ***The Victorian Orchid Club*** has resumed after a long period of wartime inactivity, and we wish it well. We know that many fine collections exist in Victoria, and we are sure that our readers will be deeply interested in reports from the Southern State. Mr. R. Bruce Hogg has been appointed press correspondent for the club. Reports of meetings, cultural notes for Victorian growers, and articles of general interest will be submitted for publication.

Victorian Cultural Notes

R. BRUCE HOGG, *Brunswick, Vic.*

September-October-November. — These three months will be the busiest of the year for Victorian growers, for it is during these months that the great bulk of Orchids is divided and repotted, and the term before dividing and after repotting is the critical one in regard to the well-being of the plants for the ensuing season. Some of the *Cymbidiums* may have been repotted in August, but I do hope that the bulk of them has been left until September, for a definite turn towards spring is necessary before repotting. In anticipation of repotting, those plants which were to be repotted, or are to be repotted, should be hardened by exposure to more air and light, and by a little reduction in the application of water for a few weeks prior to dividing. If, during the winter, your plants have received a large amount of artificial heat, and a relatively large amount of water, this hardening process is very necessary for the pseudobulbs, and although fat, they will be soft and succulent, shrivelling very badly with the subsequent dividing unless hardened. You should never attempt repotting "Slippers" until early in September, and preferably it should be left until later, while a *Cattleya* should not be potted until the base of the most forward growth shows some indication of the appearance of new root nodules.

I cannot give separate instructions for each of these months, as the instructions are dependent on the time when division and re-potting takes place, so these notes will deal with the three months grouped as one period.

Cymbidiums.—Your soil for re-potting should have been prepared, and allowed to mature in anticipation of the potting. The soil should comprise a mixture of red todea, fibrous mountain soil, leaf mould, a little tan bark, some coarse sand, and some coarse bone meal. If, temperamentally, you are inclined to over-water your plants, I would advise you to reduce the quantity of mountain soil, and increase the other ingredients to provide freer drainage. On the contrary, if you are inclined to under-water your plants, increase the quantity of mountain soil, and reduce that of the other ingredients. I do not feel prepared to give an actual mixture for growers to use, for I am convinced that the potting mixture is so closely related to the temperament of the grower that he must develop his own mixture using the foregoing ingredients.

Small plants to be potted-on should be carefully knocked out of the pot, the crocks removed, and put into a fresh pot not more than 2 inches larger. Large plants to be divided should have the whole of the old soil removed. Careful division into one,- two,- and three-bulb plants should be made, all old and dead roots should be removed at the base of the pseudobulb and live roots cut back to 5 or 6 inches in length. Place in the pot with the pseudobulbs in the centre of the pot with the live roots arranged outwards and downwards. Gently work the soil between these roots until the plant is supported, with the base of the psuedobulbs level with the ultimate ground line, which should be about ½ an inch lower than the edge of the pot. Fill in round the roots and press firmly with the fingers, but do not ram with a stick. If you do use a stick, use it gently, endeavouring, only to compress the soil to finger pressure. Bump the pot several times on a solid bench to ensure the consolidation of the compost and your plant is potted. If the weather is reasonably warm, give the plant a good watering after potting, and place it in the warmest part of your glass-house, and restrain further watering until the plant shows signs of drying out. If the weather is cold, refrain from watering after repotting until you feel that this is necessary. If, after potting, you restrict your water at the roots of the plant to a minimum and keep them in a hot humid atmosphere, vigorous root action will take place. Constant light spraying over the foliage will be very beneficial, and in the event of prolonged bright sunshine, the plants should be shaded, for they have not the root system to compensate them with transpiratory loss due to a hot dry atmosphere. As soon as you feel that the roots are moving through the new compost, the plants can be moved to a normal position and watered more frequently, but I would recommend keeping them warm, and perhaps slightly shaded during the whole of the period covered by this issue. With those pots that do not require re-potting, I recommend that about ½ an inch of the soil on the top of the pot be removed, and replaced with fresh soil mixed with a little bone meal.

Back-bulbs.—These are valueless to the plant and should be cut away when dividing, and placed in a warm part of your house, loosely, into 2 to 3 inches of fresh Sphagnum moss. Very soon a new growth will appear, and as soon as that new growth shows root nodules it should be potted in a 3½ or 4 inch pot. About a month later, if you find that the roots have entered the soil, the back-bulb can be carefully several from the growth, leaving the growth in that pot, and the same routine followed, and thus you will get two small plants from the one back-bulb. Back-bulbs have been known to provide three or more growths in this manner, but it is hardly worth the trouble unless it is the back-bulb of a valuable variety.

Cypripediums.—These do not like being over-potted, and they definitely do not like being divided frequently. The same soil mixture as for *Cymbidiums* is recommended, excluding the bone meal except in the case of really vigorous plants. In dividing, the roots should again be trimmed as with *Cymbidiums*, but great care should be taken that the pot used is not too large. Those plants which do not require dividing should be potted-on but only to a pot 1 inch larger than the previous one. With those plants which do not require potting-on you should loosen a little of the soil on the top of the pot, shake it away and replace with a little fresh soil, adding, perhaps, a little bone dust on the surface. *Cypripediums* require even more care after potting them than *Cymbidiums* do, but the same principles apply except that the shading should be heavier, and until root action starts they should never be exposed to the direct rays of the sun. In fact, at no time during the summer should the light in the *Cypripedium* house be allowed to become bright except perhaps for a short period in the late autumn, to encourage growth in the flower buds.

Cattleya Group.—This group can be left until you have dealt with your *Cymbidiums* and *Cypripediums*. Each plant should be carefully gone over, and those that require re-potting, or dividing, during the season should be separated from those which do not. Plants which you propose to divide should be severed in August at the proposed point to encourage a lead to break away from the forward eye of the back growth. While *Cattleyas* are often re-potted successfully when the new growth is about 1 inch high, I feel certain that the amateur will get better results by restraining his desire to re-pot until small roots appear at the base of the new growth, or new roots appear at the base of last year's growth. This may mean holding some of your *Cattleyas* back until February or March before re-potting, but I am sure they will suffer less damage in that manner than by potting at the wrong time. Any plant in which the compost has softened sufficiently to enable the finger to be pressed into it should be re-potted, even though there is still ample room left in the pot.

The best mixture for *Cattleyas* is one of about four parts of cleanly washed chopped black todea to one part of finely chopped Sphagnum moss. All Orchids should have a liberal amount of crocks in the bottom of the pot, and in the case of *Cattleyas*, no harm will come if you go to excess with your crocking. Dead roots must be carefully chopped away, live roots reduced to 2 or 3 inches for they will surely die and their sole purpose is to hold the plant firmly in the pot until new roots appear. Care should be taken to see that the roots are downwards and outwards when potting is complete, and potting should be as firm as is possible with a potting stick, using the power of your wrist. Some growers pot much firmer than others, but I am confident that there is no benefit associated with such action. When potting a *Cattleya*, the base of the rhizome should touch one side of the pot, and the forward eye should point in the direction of the other side, and the pot selected should be large enough only to take two growths if potted before the new growth appears, or one growth if potted after the new growth has appeared. The plant should sit on a crown in the centre of the pot, level with the top of the pot, and the fibre should be clipped away so that it is ½ an inch below the edge of the pot, thus ensuring that when watering the water passes down the side of the pot. This will stop the whole of the compost from rotting and becoming sour.

After potting, *Cattleyas* require very careful treatment, and water should be restrained to an absolute minimum until sufficient roots have been developed to ensure the surplus water being absorbed. If, when watering a *Cattleya*, water lies on the top of the pot only for a fraction of a second there is something wrong with your potting mixture or your potting technique. These plants should be in a mixture through which water could be run for an hour if necessary without ever accumulating on the top of the pot. When you have potted your *Cattleyas*, it is wise to stake one or more of the back-bulbs to ensure that the plants are trained into nice specimens. Subsequent to potting, as I said, water should be given at an absolute minimum, keep the house warm and shaded but water the floor and your benches as frequently as you can conveniently do so.

With all of the foregoing groups, in damping down your house and wateriing your benches, you should wait until the temperature reaches a minimum of 60 deg. F.

Dendrobiums.—Treatment the same as for *Cattleyas,* except that division and re-potting should take place in the late spring, just as the new growths appear from the bases of the plants.

Other Species.—Where instructions as to treatment of other species are required, I suggest that you write to me at 44 Normanby Rd., Kew, Victoria.

● ***Victorian Orchid Club.***—After being in recess for the greater period of the war, the Victorian Orchid Club held a meeting on the 27th March to decide whether is should again resume its monthly meetings. The meeting was well attended, and a unanimous vote decided in favour of resumption. The President, Mr. E. P. Johnson, indicated that he could not again accept office, and his resignation was reluctantly accepted. The Office-bearers are:—

President, R. Vick. Vice-President, Basil R. Hodgins. Secretary, G. E. Floyd. Treasurer and Publicity, R. Bruce Hogg. Librarian, Alex Burns. Committee, Messrs. E. Peterson and Norman Scoble. Auditors, Messrs. A. E. Hingeley, A. E. Grant.

The future of the Club should be bright in the hands of the foregoing executive, and at the initial meeting members expressed a desire for a vigorous and progressive policy which is sure to be carried out by the new committee. Meetings will be held at the Australian Church Hall, in Russell Street, near Flinders Street. This hall is sufficiently commodious, centrally situated, and in a position where the parking of cars presents no difficulty. Meetings will be held on the third Monday in each month. Interstate visitors are cordially invited.—R. Bruce Hogg.

● ***Strange are the ways of Nature.***—When a plant feels that its life may be in danger, it throws the whole of its remaining energy into propagation. About two years ago, I received a consignment of *Cymbidiums* from England. They were 4 months on the water, arriving in a bad way. One plant has thrown up two flower spikes which, when nearly a foot high, changed into growths. These I severed about 6 inches above the pot and planted as cuttings. Each now has a full sized bulb, and a new growth, and should flower next year. How does Nature change a flower spike which must be fully formed inside into a leaved growth? Last year Mr. Hodgkins had a growth apparently normal which when several inches high developed flower bulbs in its apex, although it had leaves 6 to 8 inches long in normal numbers and form. This year Mr. Wright, of Heidelberg, Vic., has had the same experience. Some years ago I had two old growths of very good *Cypripediums* given to me, each with two leaves only, and nearer dead than alive. I plunged them in moss, one made 5 growths and the other 4. Each old growth died when the young ones were about an inch high. Don't despise a "Slipper" growth no matter how old it is, and if you wish to propagate, sever the old growth before it actually dies, and you will get many young ones as a reward. 2/6/1944, R. Bruce Hogg.

● *Zygopetalum x Blackii, var. Negus A.M.,* shown by Dr. K. Kirkland at the March meeting of the O.S. of N.S.W., is a hybrid derived from crossing Z. *crinitum* with the hybrid Z. *Perrenoudii.* Z. *x Blackii* is the correct name, and not Z. *Burkei* as suggested in a supplementary note.

● The O.S. of N.S.W. Sectional Show for *Cypripediums,* augmented with *Cymbidiums* and *Cattleyas,* was held at the Austral Salon, Elizabeth St., from 5 p.m. until 10 p.m., on Tuesday, July 4th. The display of *Cypripediums* was ample evidence of the popularity of the group, and of the great improvement in the range of colour attained by the hybridist. Some of the exhibits were the first flowerings of the last batch of hybrids to reach Australia before restrictions cut off importations. The efforts of the exhibitors were obviously appreciated by all, judging from the interest taken in the different varieties, among those attracting attention being C. x Hederspont, C. x Candace, C. x Elissa, C. x Koritza, C. x Cheddington, C. x Ponticus, C. x Dickler, C. x Lavinia, C. x Nirita, C. x Mildred Hunter.

● ***New Members.***—The Orchid Society of New South Wales has appointed Mr. W. Worth to act as Official Host and to advise and generally help new members and visitors. The general idea is to enable everyone to quickly "settle in" and "feel at home" at the monthly meetings. If Mr. Worth can be of assistance by introducing officers and members of the Society, or by supplying any information, please contact him either at his home address, No. 4 Ward St., Willoughby, N.S.W. (phone JA1533), or at the monthly meetings.

● Membership subscriptions to the Orchid Society of New South Wales for 1944-45 are now due, and payable to the Hon. Treasurer, Mr. J. Bisset, 48 Wareemba St., Abbotsford, N.S.W. **Members in arrears are requested to post their remittances by return mail.**

Some Cypripedium Hybrids

R. VICK, *Canterbury, Vic.*

● About 1940 I imported from England a number of up-to-date unflowered *Cypripedium* hybrids. During the past two years a number of these has flowered for the first time, and the photograph shows a group of nine in flower last winter. They were grown in an unheated glasshouse. These were not specially selected plants in flower, but just a group flowering at the one time. A number of others, of which I have no photograph, was equally as good. The modern "Slipper" is now a very beautiful creation. The percentage of "duds" is exceedingly small, as I anticipated, and if the remaining unflowered plants give equal results I can confidently recommend growers in Australia to import this type of plant—if and when possible.

Brief descriptions of *Cypripedium* flowers illustrated on page 47. Back row from left to right:—

1. *Morea Grandis x Grace Darling*: Dorsal sepal, white with green base, scattered purple spots mainly centrally; ventral sepal green, few spots in lines, very good form; petals green with brownish flush mainly on top half; pouch green with light brown flush, good shape. A very nice flower, well balanced, good size.

2. *Elidia x Chrysostum Our King*: Dorsal sepal light greenish-cream undercolour, shading out to wide white margin, light purple flecks all over, large, good shape; ventral light creamy-green, lightly spotted, clear edge; petals long but not so wide, flushed purplish brown on top half, spotted lower half, with purple centre line; pouch creamy-green, veined and flushed with purple tinge; huge flower.

3. *Gold Mohur x J. M. Black, Beckton's var.*: Dorsal sepal light greenish-yellow (becomes more yellow with age) shading out to white margin, large purple-brown spots; ventral light greenish-yellow lightly spotted towards base; petals prettily flushed with almost vieux-rose shade, with strong central line, bottom half spotted and more lightly flushed. Pouch similar flush to petals, yellow edge. A pretty flower.

Middle row:—

4. *Finetta x A. E. Dale*: Dorsal sepal white background with deep rose centre and white margin; ventral sepal unusual, mottled dusky green; petals of good width, upper half brownish-yellow, lower shows more green through lighter flush, with clear yellow margin; pouch brownish green of unusual colour, inside flush with somewhat the same shade as that of the dorsal.

5. *Gertrude West var. Othello x Carcroft fine var.*: Dorsal sepal very broad and fine shape, pure white with light green base, all evenly spotted purple ventral sepal wide, good shape, greenish shade with some spots; petals very wide and well balanced, golden green, purple spots all over; pouch very good, greenish shade with brown spots and stippling in front, nicely spotted internally. A lovely flower of great substance.

6. *Noel Hardy x Hestia, Empress of India*: Dorsal sepal medium size, erect, mainly deep purple shade, white margin, densely coloured base almost reddish-purple; ventral sepal long and green with spots in lines from base; petals, yellowish-green basal colour with mahogany flush, heavier on top half, clear golden-green edge; pouch lightly flushed over greenish-yellow, inside spotted and flushed.

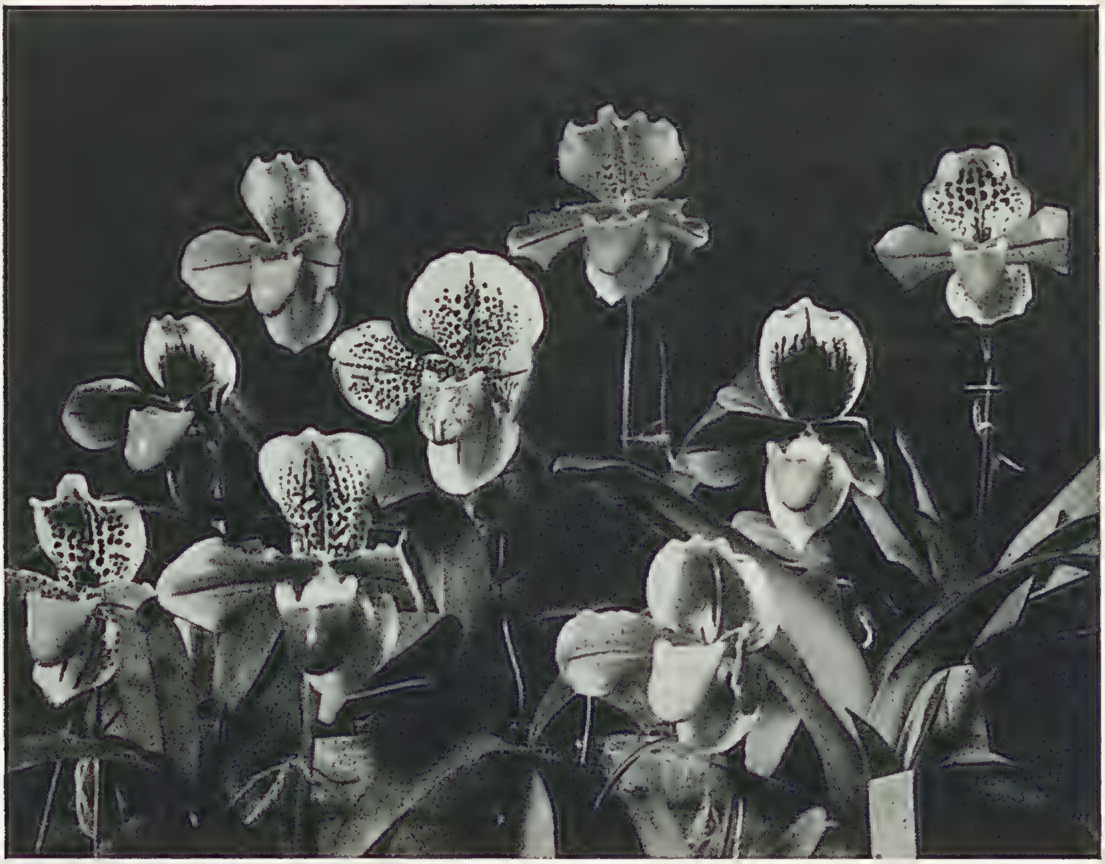
Front row:—

7. *Cappa Magna (F. Sander, F.C.C.) x Cardinal Mercier*: Dorsal sepal golden basal colour fading out to white margin, large purple-brown spots; ventral sepal pale creamy-green with light spots and markings from base, clear extremity; petals, flushed brown, heavier on top half, lightly spotted, rather narrow with tendency to folding back; pouch lightly flushed brown.

8. *Hestia Nobilior x J. H. Walker*: Dorsal sepal golden-green very freely spotted with purple-brown spots, ¼ inch white margin right round; ventral sepal very wide, of fine shape, pale green with few similar spots, also has white edging, widest at sides; petals wide, well-shaped, flushed bright mahogany, pretty green edging; pouch good form, deeply flushed bright red-mahogany, nice edging. A very pretty flower.

9. *Gold Mohur x Mrs. Eley, var. Rosemary*: Dorsal sepal shell-shaped, deep brown (almost golden brown), flush on a greenish-cream undercolour, fading to clear deep cream, then to white margin—pretty effect; ventral light green with brown lines from base, clear at extremity; petals brown flshed on greenish-cream, waved; pouch same as petals with brown streaks and light flush. A very nice flower that becomes rich golden-yellow and brown in colour when fully developed.

● *New Address.*—The O.S. of N.S.W. now meets at the Royal Empire Society Hall, 17 Bligh Street, Sydney.



CYPRIDEDIUM HYBRIDS

Top Row, from left to right: (1) *Morea Grandis x Grace Darling;* (2) *Elidia x Chrysostum, Our King;* (3) *Gold Mohur x J. M. Black, Beckton's var.*
Middle Row: (4) *Finetta x A. C. Dale;* (5) *Gertrude West, var. Orthello x Carcroft;* (6) *Noel Hardy x Hestia, Empress of India.*
Front Row: (7) *Cappa Magna (F. Sander F.C.C.) x Cardinal Mercier;* (8) *Hestia Nobilior x J. H. Walker;* (9) *Gold Mohur x Mrs. Eley var. Rosemary.*

● ***Botanical Section.***—The inaugural meeting of the Botanical Section of the O.S. of N.S.W., was held in the Society's rooms on June 29, 1944, from 7 p.m. to 8 p.m. The Rev. H. M. R. Rupp was unanimously elected chairman for the ensuing year, Mrs. Pearl Messmer being chosen as the Hon. Secretary. Mr. Rupp delivered an address on the Orchids of the county of Cumberland, illustrated with photographs and drawings. Field excursions will be arranged, and those interested can obtain particulars from Mrs. P. Messmer, 64 Treatts Rd., Lindfield.

● Subscriptions for the Australian Orchid Review, 6/- (six shillings), should be posted to Australian Orchid Review, c/o Messrs. Shepherd and Newman Pty. Ltd., Yurong Street, Sydney, N.S.W.

● Editorial matter, M.SS., and photographs should be sent direct to P. A. Gilbert, Hon. Editor, *The Australian Orchid Review,* 37 Colin Street, Lakemba, New South Wales.

Messrs. Shepherd & Newman Pty. Ltd., Yurong Street, Sydney, N.S.W., publishers of the Australian Orchid Review, have relinquished their box at the G.P.O., Sydney, and request that all correspondence be addressed as above.

● John Bisset's Annual Orchid Exhibition will be held at David Jones Ltd., Main Store, Market and Castlereagh Streets, Sydney, during September 13, 14 and 15, in aid of The Kindergarten Union of N.S.W.

Notes from Jamberoo, N.S.W.

H. E. COLLEY, *Jamberoo, N.S.W.*

● In answer to a query relative to this locality, my place is almost on sea level, about 50 feet above, and six miles from the coast at Kiama. Although the district is subject to heavy frosts at times they seldom, if ever, reach the garden, and the only shelter my *Cymbidiums* have is at flowering time when I put them under my lath shelter, one end of which is covered with "Windolite," or rather I should say, was, for it has passed its better days, and does not now afford much shelter. This serves to emphasise once again, my experiences with *Cattleyas*, etc. Some few years back I mentioned my *Cattleyas* to the Society—once sending a *Trianae* in flower but which unfortunately was damaged in transit—and now after a period of some years I am still flowering these Orchids regularly. Here's what I have coming along at the moment:

Bc. x Cliftonville, 1 sheath well developed. *Bc. x Agnes McCann,* 1 sheath, *Bc. Massangeanae x Hardyana* 1 sheath, *Catt. Trianae* with 8 growths and 2 sheaths just opening out, and *C. Harrisonae var. Loddigesii* 2 sheaths each with 2 buds showing colour, and 1 other *Trianae* with 1 sheath well developed. All, with the exception of the last-named, are in baskets.

Dendrobiums do not grow the best with me, and with them the only successful ones are those in baskets. *Aggregatum, Parishii, chrysotoxum, Pierardii,* and *thrysiflorum* being the only ones that flower regularly. The Australian *Dendrobes* grow like weeds with me. *Vanda coerulea* I can do nothing with, though I have tried it under every possible condition I can think of. *Vanda suavis* never fails and usually flowers twice. This year it gave me two large sprays in the spring, and two again in the late summer. *Vanda tricolor* flowers occasionally, and *V. teres,* though growing well has not yet shown any signs of flowering. I had rather a curious experience with a back bulb of *Cymbidium Louis Sander.* Some growers have told me they find this *Cymbidium* hard to flower. It always flowers regularly with me, and this year I found that a large plant of "Louis Sander" was, in February, putting out numbers of new growths. It had flowered in the spring of last year but never made any new growth until February of this year. Thinking this would throw it out of its flowering cycle completely I broke the plant up into three lots and repotted. Last week I found a well-advanced flower spike on one plant. Now for the "Louis Sander" back-bulb. I first potted a back-bulb some four years ago, and, as it shot so vigorously, took the new plant away and repotted the old bulb. It again threw out another growth, and, believe it or not, I succeeded in getting a third growth from this same bulb. This last growth is coming away so well, and the old bulb still hard and healthy looking, that I think I must give it yet a fourth chance to see what it will do. Being of Scottish descent this wholesale propagation from one bulb has its appeal.—H. E. Colley, 4/5/1944.

PHALAENOPSIS AMABILIS
Grown by W. Sievers, Gladstone, Q.

● ***Orchid Exhibition.***—The Carrington H. Deane Annual Orchid Exhibition will be held at Anthony Hordern and Sons Ltd., on September 27th, 28th, and 29th, in aid of The Red Cross Society, N.S.W. Division. Prizes will be awarded to amateurs competing in the various classes of Orchids.

● *Cypripediums* that flowered during the early winter should be repotted without delay, as it is getting rather late for these to settle down in time to flower in season next year.

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By J. MURRAY COX

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The dates of the next meetings of the Society are as follow:—

SEPTEMBER, THURSDAY, 28th

OCTOBER, THURSDAY, 26th NOVEMBER, THURSDAY, 30th

Please address all communications regarding the Society to the Hon. Secretary. Subscriptions for Membership should be forwarded to the Hon. Treasurer. MSS, photographs, and editorial matter to be addressed to the Hon. Editor.

●

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Meeting Place: Miniature Rifle Range Building, Boundary Street, Brisbane. Meetings held on the Second Friday of each month.

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AUSTRALIAN ORCHID REVIEW

Volume 9 **DECEMBER, 1944** No. 4

The author of each article is responsible for the facts and opinions expressed therein.

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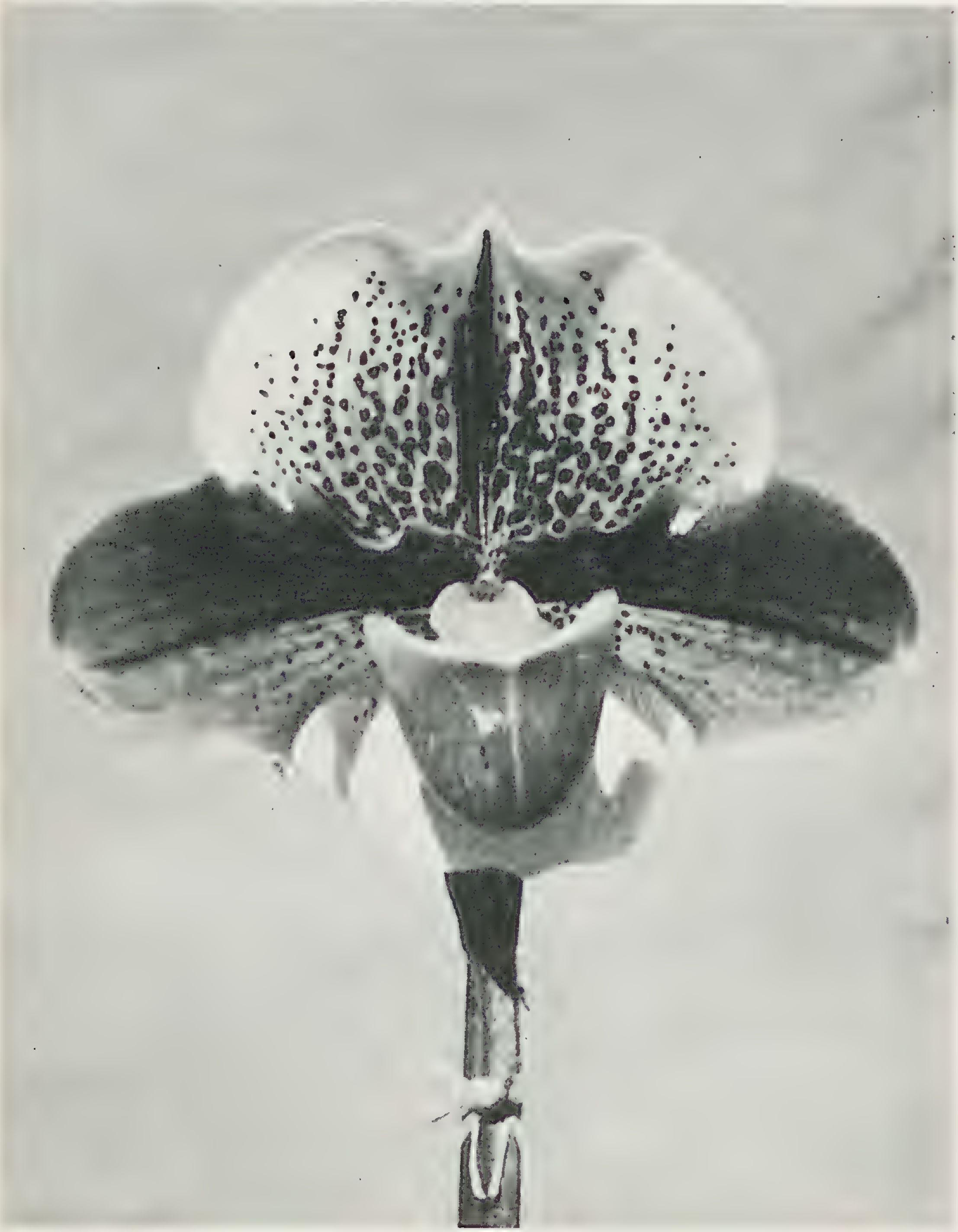

CYPRIPEDIUM MILDRED HUNTER X ROBERT PATERSON

Grown and photographed by L. F. Hawley, Lindfield, N.S.W.

The Problem Plant

A. J. DALEY, ***Gympie, Qld.***

● Like most growers whom it has been my pleasure to meet, I endeavour to cultivate a few Orchids in what is known as a "bush-house." Here I placed plants from all over the world, and on first flowering I considered myself, as they say in America, a "super-dooper" Orchid expert. However, when this war is over, and conditions return to normal, I doubt if I will bother with *Dendrobes*, apart from *nobile*, the only species which continues to hold "size" in my *Dendrobe* collection. If I am tempted to grow others, such as *fimbriatum Paxtonii, fimbriatum occulatum, Wardianum, superbum*, etc., I will "scrap" my plants after about three years, as I do bulbous plants, and buy anew, for, after all, I grow Orchids to produce flowers of size as well as foliage, and at present I am not attaining that end. Nor could I greatly alter my present conditions because of the locality and size of my bush-house.

Regarding *Cattleya* hybrids, which probably are grown with most success in this district, I find that the first flowering, after arrival from glasshouses in the south, produces blooms to rave about, but on the next occasion they lose size, though not as noticeable as in many members of the *Dendrobe* group. However, Mr. McFie, of Gympie, a grower of long standing, does attain considerable size, which leads me to think my plants will eventually become acclimatised, and behave even as his do.

Vandas are the exception to the rule, and with these, too, I have my heartaches. Two plants of *tricolor*, growing side by side, flower regularly, but their neighbour, *suavis*, fails me. Readers will say "shift it," but with a mass of roots traversing benches and finding their way into the soil, I hesitate to give the plant a set-back, and hope for the best. *Agnes Joachim* and *teres* thrive in the sun, and are gradually ascending the laths on the outer eastern side of my house. *Kimballiana* and *coerulea* are not happy here, and because I have no room for failures in the house, these will be deleted.

One of my objects in this paper is to register my regret that articles by such members as Mr. T. H. James have been discontinued in the Review. So much is written on the scientific side, which, while very interesting, may tend to supersede the more simple things connected with the culture. For instance, many members to whom I have mentioned *pH* frankly admit it is "above" them, and of little interest. I imagine my former teacher of botany, Dr. D. A. Herbert, had this in mind when writing a recent article.

Now if somebody had told me that my *Zygopetalum*, hung where it received full sunlight all day, and grew into a magnificent foliage plant, did not require such conditions to flower, I would be admiring blooms like my friend to whom I presented a back-bulb. His plant, on a bench, received sunlight till about noon, then shady conditions. I hope to benefit next year by this experience. Why does the hybrid *Cattleya*, x *Orator* refuse to prosper with me, though I grow the *Cattleya* branch of the group reasonably well? Three plants I have purchased from time to time behaved in the same manner. After arriving from the south they each produced a bulb, but towards the end of winter the "eyes" turned black and rotted out. A watery paste of slaked lime which I have found excellent for this condition in other plants was used without avail. Again, southern growers and dealers have told me in good faith that *Cymbidiums* will not grow here, yet they flourish with all followers of the "cult" in this district.

This is the type of information I believe the majority of us, who have recently joined the "ranks," wish to know. Let the experienced members tell us when plants flower, the conditions under which they personally flower them, and whether they think it advisable for the man with a limited purse to purchase certain species. The work by J. Murray Cox, to be printed by the publishers of the Review, without doubt will be a boon to all growers, and practical experience by such members as Messrs. Taylor and Schnepel, of North Queensland, would be of vast benefit to readers. I was amazed at the generous offer regarding *D. undulatum* recently made by Mr. Taylor, which shows we have excellent spirit among Orchid enthusiasts, and in a subsequent letter he taught me much regarding the growth of *Phalaenopses*. From his observations and experiments he states that water-vapour, and not overhead watering, is the secret of success with these plants.

In conclusion, I am sure every grower has a "problem" plant, about which he would like to ask many questions, while, on the other hand, much valuable advice would be forthcoming if members could be induced to put these matters in print. After all, it is to this end that we become members of Societies and subscribe to their official organ, a credit, in such difficult times, to our Hon. Editor.

"I Liked Sydney"

R. BRUCE HOGG, *Brunswick, Vic.*

● For weeks prior to my visit to Sydney to see J. Bisset's show, I, and other enthusiasts in Melbourne who also visited Sydney, looked forward keenly to the opportunity of seeing the show, and many of Sydney's best collections. We were certainly not disappointed.

This year's show was a very great improvement on that of last year, and the average quality of the flowers on the display bench, I thought, was better, but last year the several best were possibly better than those this year. One thing stood out, and that is, that it is possible to produce the perfect *Cymbidium* without a direct relationship to *Alexanderi Westonbirt* variety. I do not wish to mention the names of exhibitors, or to take part in the friendly rivalry which exists, but I was impressed at the friendly spirit shown, and the sincere congratulations offered to the victors by those defeated.

The champion *Cymbidium* was an amazing flower, not a direct *Westonbirt*, and perhaps has no *Westonbirt* blood in it. The colour was unusual, its segments very broad, its texture particularly good, and I particularly liked the way the flower had opened fully and displayed itself. The colour was attractive and unusual, but what a wonderful sight it would have been if possessed of the colour of *Ceres F. J. Hanbury* or *Joy Sander magnificum*! The raceme was borne by quite a small plant, and improvement can be expected next year. However, the display which impressed me most deeply was one solely of colour, also without *Westonbirt* blood. This was a blending of colour comprising green, deep pink and deep wine, in such a manner as to make a really beautiful combination. The green, I think, is the most brilliant colour that I have seen, while the pink was radiant to a degree. The dark one, one of the *Carisbrooks,* was extremely dark, but, like all *Carisbrooks,* it was not radiant.

There were many extremely fine *Westonbirts,* but the show bench will be improved when fewer *Westonbirts* are displayed, and more good, highly coloured varieties are introduced, for, in spite of their remarkable quality, there is far too great a sameness of colour about the majority of them. However, I did see one pink *Westonbirt,* which was very beautiful.

The public of Sydney should feel very grateful to Mr. Bisset and his loyal helpers for the amount of work done in organising and staging this show. To look at the number of plants displayed, and bear in mind that each had to be carried in from the street, loaded on to trucks, lifted three floors in a lift, and then wheeled in and set in position, it gives one a picture of the amount of work involved, and after only three days, the reverse had to take place.

I rather think that, with the immense collections existing in Sydney, it should be possible to fill a hall of similar size entirely with show plants in different sections of a huge competition. It is obvious that Mr. Bisset is slowly working to this goal, and what a sight it will be when he achieves it!

Some very interesting miscellaneous Orchids were displayed, but the *Cattleyas* and "Slippers," to me, at any rate, were disappointing. However, the season was rather late for "Slippers," and not many *Cattleyas* flower in the springtime.

Moving around the collections in Sydney, I was deeply impressed with the immensity of some of them, entire backyards, covered with pots touching each other. In one case, I am told that the wife has had to be compensated for the loss of space in which to hang her washing. At one collection I was impressed with the health and vigour of immense plants of valuable Orchids in large drain pipes, and it would appear to indicate that the *Cymbidium* does best when planted out, and not disturbed for a few years. This, however, is quite contrary to our experience in Melbourne. We have grown very large plants, but they always suffer very severely when ultimately divided, while with an annual or biennial potting programme, the plants do not seem to suffer so severely.

We, in Melbourne, do not expect to build up such huge collections, for the glass covering alone would cost a fortune, but we are certainly going to grow our best plants on, and one of these days endeavour to catch Sydney growers napping, and "scoop the pool," but I think I guess rightly in suggesting that that could never possibly happen twice running, and I hope that when similar shows are arranged in Melbourne, that Sydney growers will also display plants, and create that spirit of constructive rivalry which is so necessary to keep our hobby fully before the public.

We were entertained royally by Sydney growers, and we are very grateful to them. We were very well received by all the enthusiasts at Bisset's show, and it would seem that the stage is set for a very close and hearty co-operation between Orchid growers in Melbourne and Sydney.

One other point interested me particularly, and that was the seedlings transplanted from agar which Mr. C. Cambourn is growing. This would indicate that he has mastered the most difficult part of production of Orchids from seed, and should indicate that at an early date Australian seedlings will be grown in large quantities at Orchid nurseries, and be available to the rapidly increasing number of enthusiasts at reasonable prices. This should be a very big factor in extending the Orchid cult rapidly.

I would like to think that enthusiasts from Sydney who visit Melbourne would contact members of our Club and give us the opportunity to provide facilities for them to visit Melbourne collections in the same manner in which they greeted us.

● Dr. J. A. Vote was the most successful exhibitor at the J. Bisset Orchid Exhibition held during September, 1944, winning the "John Bisset Silver Cup" for the champion *Cymbidium* (*Louis Sander* x *Falcon*), and the "Black and Flory" Silver Cup, valued at 20 guineas, for gaining the highest aggregate of prize points. Dr. Vote is one of the most enterprising and consistent exhibitors in Sydney at the present time, both at the monthly meetings of the O.S. of N.S.W. and competitive shows.

● The Novice Section was a highly popular innovation at the "John Bisset Orchid Exhibition," 1944, two classes being introduced to encourage growers who have not won an award at any previous show. The first prize for the group of three *Cymbidiums* was awarded to W. Worth, and the first prize for the best *Cymbidium* was won by D. Hemmings. The popularity of this Section was particularly pleasing to Mr. Bisset, who has signified his intention of considerably expanding its scope at his next show.

● The frontispiece is an illustration of *Cypripedium Mildred Hunter* x *Robert Paterson,* which won the first prize for the best *Cypripedium* at the J. Bisset Orchid Exhibition, 1944. It typifies the prevailing form which hybridists are striving to establish, being nicely balanced in all its floral parts. The ventral sepal is sufficiently conspicuous to form a background for the "pouch," but not large enough to detract from it.

● The colourful array of *Cymbidiums* made it rather difficult for the judges to allocate the prizes at J. Bisset's Orchid Exhibition, for the most distinctively coloured *Cymbidium,* the final selections being: First prize, *Louis Sander* x *Falcon,* Dr. J. A. Vote; Second prize, *Lyoth* var. *Nancy Hart,* C. Cambourn; Third prize, *Janette,* C. C. Hildebrandt; H.C., *Carisbrook,* C. Cambourn; Commended, *Charm,* Dr. J. A. Vote.

● At the "Carrington H. Deane Orchid Exhibition," 1944, Dr. J. A. Vote became the outright winner of the "Sander Cup," and the "Sander First Prize Bowl." The Doctor also won the first prize for the champion *Cymbidium* (*Flamingo*).

● Back numbers of the Australian Orchid Review are still available, excepting nine issues, which are Vol. 1, Nos. 2 and 3; Vol. 2, No. 1; Vol. 3, No. 3; Vol. 4, Nos. 2 and 3; Vol. 7, No. 2; Vol. 8, No. 2; Vol. 9, No 1. Copies of Vols. 1 and 2 are priced at two shillings each, Vol. 3 one shilling and ninepence each, and all subsequent issues one shilling and sixpence each.

● Membership subscriptions to the Orchid Society of New South Wales for 1944-45 are now due, and payable to the Hon. Treasurer, Mr. J. Bisset, 48 Wareemba St., Abbotsford, N.S.W. **Members in arrears are requested to post their remittances by return mail.**

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Extracts of Fact and Fancy from a Diary

Continued from September issue

F. DOUGLAS, *Mosman, N.S.W.*

January, 1944: Grandi., enlargement of eyes at base of growth. One flower spike, definitely. Others look like spikes. Two set in bushhouse to be cool and dry, perhaps that may assist them to hold and open the flowers. Weather ideal.

Gig., great strength on leads, growing steadily. Condition good and clean.

February: Grandiflorum in sun slightly burned, dry, 103 F. in shade, roots resting, 12 spikes confirmed. Set some in shade and some in sun. Keeping some dry and others watered. Convinced that the winter's sun sets the flower spike. One three year old grown thus also has a spike. Exhibited N.S.W. Orchid Society's meeting, January. Repotting, roots resting. Find that roots do not go to the tin but evade the sides. Unlike other *Cymbidiums* they appear to flower best in wooden tubs, then the pots, and lastly, in tins. Can't say if a cracked pot influences them in the same way as it does others.

Giganteum growth stopped, roots still active, many flower spikes showing.

March: Grandi., 16 spikes stretching out. One spike with buds emerged, a number yellow, and 1 spike going. Both were shaded and dry, only rain, others in sun and watered O.K.

Giganteum taking a breather, almost every lead with a spike at foot.

April: Grandi flower spikes holding, watered freely. Roots and growth active. Plants which were most seriously scorched appear to grow best and have in proportion a greater multiplicity of leads. Gig. roots commencing to move, flower spikes stretching. Noted an interesting fact. In early February a plant was set aside to be given to a friend, for convenience it was put against the garage in the shade. It remained there for two months and has not produced a spike. All the equivalent plants have two or three spikes. My assumption is that the lack of light and heat during that particular period accounts for the non-flowering. The other factors of medium, moisture, and atmosphere to all practical purposes were stable.

From that and similar assumptions the deduction is that on mature *giganteum*, fllowers are determined (approx.), Jan.-Feb., observed March-April, and open April-May. A period of four months between inception and realisation. *Grandiflorum* flowers determined July, August, discernible January-February, and if you are lucky, open August-September, a period of at least 13 months. *Lowianum* induced October-November, may be seen March-April and "voila" September-October, a period of 11 months.

May: *Grandi*, few more buds turned yellow. Growth active but slow.

Gig. flowers past, no movement apart from root action.

June: *Grandi*, all flowers now holding, growth good, copious rain. *Gig.* flowers past, no movement.

In conclusion may I stress that the preceding notes are extracted from a log book and that they only give a record of observation on *Cymbidium grandiflorum* and *Cymbidium giganteum.*. I do not want them to be misconstrued as general cultural recommendations. They are applicable only under similar circumstances. Well aware am I that *Cymbidiums* are not likely to be successfully grown in the open sunlight unless favourable factors are present. The factors are:—

1. They have to be acclimatized to it.
2. Light: Aspect needs to be fairly sunny, favouring N.E.
3. Heat: Situation must be frost free, protected from wind, and not be a hot spot or subject to reflected heat and light.
4. Atmosphere: Free circulation of air, without drafts of cold or dry air currents.
5. Medium: Suitable to the plant, time factor, habits of cultivator, proportionate to size of pots, placement, soil and adjacent plants to be anti-alkali and clean.
6. Moisture: Appreciation of the water, its advantages and disadvantages. Applied with discretion and judgment according to the cycle and season of movement and rest, etc.

In a situation subject to frosts, and its attendant dry atmosphere, or under shade during winter the plants would adopt a different growing season. In the first instance it would appear to be beneficial to *grandiflorum*, and confirmed by its flowering freely in such areas. Incidentally in those circumstances this diary may be meaningless, if not downright silly.

For the last two years at least the monthly report covers the previous month. This because I normally jot the notes down on or about the first of the month.

Criticism or questions invited and welcome.

Victorian Cultural Notes

R. BRUCE HOGG, *Brunswick, Vic.*

● The next three months are amongst the most important in the year. Your plants will just have recovered from the shock of repotting, and they will be building up their growths and vitality, getting ready for next year's flowering. Also, the next three months are three very critical months, for great damage can be done to Orchids under glass by incorrect control of shading and water. This applies particularly to *Cattleyas* and "Slippers." If the direct rays of the sun focus on a *Cattleya* or a "Slipper" plant they can kill it within a few hours. You should judge your shading by the reaction of your eyes to the light inside your glasshouse. If it feels bright and glary, the shade should be put down at once. On the other hand, if it is not a strain to the eyes to be in the house, the plants will be able to absorb the sun's rays without damage.

During these three months a great deal of water should be used, but the plants themselves should receive only sufficient to keep them moist at all times, without being wet. However, the benches and the walks should never be allowed to become dry. Also, during the summer, your ventilators should be wide open, except for cold snaps, to allow the circulation of as much air as possible. You must remember that this air, in circulating through your house, will be carrying moisture out, thus the necessity for constant spraying. In really hot weather, if, in spite of shading, the heat of the house becomes oppressive, I would recommend that the doors be left open, unless a strong wind is blowing, and if your house is inclined habitually to become too hot, it is quite a good plan to make a couple of doors of hessian and timber to fit your door cavity, and, leaving the main doors wide open, a lot of air will pass through the hessian.

"Slipper" plants require more shade than both *Cattleyas* and *Cymbidiums*, and *Cattleyas* require a little more shade than *Cymbidiums*. As summer approaches, I always nail an extra strip of hessian on the inside of my house to provide additional shade over the "Slippers," and they respond very well to this treatment.

By the time you read this you will have completed the repotting of your "Slippers" and *Cymbidiums*, and any plants that still require potting should be held over until next year, but you will be potting odd *Cattleyas* throughout the summer and autumn. At regular intervals you should look your *Cattleyas* over, and as the new root nodules appear on the last growth, you have an index as to the time for repotting, and it should be done at once.

Regular spraying of your house with "Pestoxol" is beneficial, particularly in summer time, as insect pests thrive under the warm, dry conditions. You would do no harm by spraying the whole of your plants once a fortnight with a 1-in-40 mixture of "Pestoxol." Also, I would recommend that every plant of *Cattleya*, "Slipper," and *Cymbidium* be dipped in "Volk." Obtain an old oil drum big enough to allow you to dip your largest plant, mix "Volk" in the proportions of 1-in-40, take your plants, one at a time, hold the pot upside down in your hands, and dip into the "Volk" as far as you can without allowing the soil to touch the "Volk." After a few seconds' immersion, lift the foliage out, and shake it to remove the surplus "Volk," laying the pot on its side till the foliage is dry, then replace it. This treatment, I think, is the equivalent to a good bath for a human being, and when you water subsequent to this, you will find that the foliage looks far more attractive. This treatment, applied twice a year, should ensure that none of your plants is attacked by scale.

A clean pot indicates a good grower, and I would recommend, at least twice a year, that the plants be carried out of the house, one at a time, and all slime and fungus washed off the pots with a scrubbing brush.

Finally, you should have discontinued using heat about the end of October, but perhaps a few uninitiated growers are still firing their boilers. This should stop, for the heat from the sun is more than enough for the plants' requirements. As late summer approaches, increase the ventilation and exposure to air, to harden your plants and encourage the development of flower buds.

● Photographs of outstanding Orchid flowers suitable for the "Front Cover" illustration, or the "Frontispiece" are required for the Australian Orchid Review. Those of single flowers, or racemes with a few flowers, are preferable to thickly clustered ones, to clearly show the character of each flower. The Orchid Society of New South Wales will purchase any prints accepted by the Hon. Editor for reproduction in this "Review."

Orchids—the War and the Future

R. BRUCE HOGG, *Brunswick, Vic.*

● I feel that at this stage in the War we are fully justified in studying its effect on Orchid culture and also its probable effect on the future of the Cult. In this address, I propose to indulge in theory, theory which I cannot altogether claim is based on fact.

Prior to the outbreak of war, there is little doubt that England was the home of the commercial culture of hybrid Orchids for world markets. I am aware that immense quantities have been raised in America, but since these have always been retained for the home market, they are not an influence on world supply. Many of the world's finest private collections were in England prior to the war. England also housed the world's leading commercial growers, firms whose names are very familiar to all of us. What has happened to these private and professional collections after five years of war.

England has been bombed to such an extent that from the few rumours which have drifted to Australia we can safely estimate that the losses have been enormous. Five years of war has brought such restrictions in the use of fuel that little has been available for Orchid culture, and in consequence, many very valuable collections have been liquidated, most of the plants finding their way to America. Fuel shortage and the shortage of manpower have compelled the discontinuance of propagation from seed, similar reasons have forced most large professional growers to dispose of all stocks except a small nucleus on which to rebuild after the war.

The net result of this is that no new varieties will be available until the hybridist has again produced seedlings of flowering size. This will take at least seven years for commercial quantities to come forward. A few plants of old varieties will be available, but I anticipate that the demand will be such that prices will be prohibitive and that post-war catalogues will include prices never thought of in recent years. The private growers in Europe will rehabilitate their glass and come into the market with the idea of resuming their hobby. The commercial growers will be reluctant to sell, at least until division has considerably increased their stocks. From all this, the natural conclusion is that for the first time for many decades good varieties will probably command a larger price than the same varieties brought before the war.

This all gives us breathing space, and the lesson to be learned by Australian growers is that they will be far wiser to purchase divisions of plants which they have seen in flower in Australia rather than buy a "pig in a poke" abroad, where the supply position is far worse than it is in Australia. Australian growers were very active prior to the war, and the probability is that many of the world's finest *Cymbidiums* are in this country. A division purchased in Australia can be reasonably expected to flower the following season, one of equal size purchased abroad may take years, similarly an Australian plant will gain at least a year's growth on its overseas competitor, if purchased at the same time.

So far as quality is concerned Orchids have made greater strides during the past 25 years than during the previous century. Even in my short experience, I am constantly culling plants which I thought champions a few years back. Plants commanding high prices have in a year or two fallen to moderate prices, not because of over supply, but because the hybridist was making such rapid strides. Unfortunately, the war has set this progress back a decade. There is little doubt that large quantities of seedlings will be raised in this country in the future. We have the parent plants, and I think we have mastered the difficult problem of propagation. The post-war shortage and boom will last only until large quantities of new seedlings are available, and then there is sure to be the natural reaction, followed by a fall in prices to normal when due allowance has been made for the relative degree of inflation existing at the time.

There is little doubt that the *Cymbidium* commands at least 90 per cent. of Australia's patronage, and for that reason, my thoughts are more with the *Cymbidium* than with other species. This species multiplies so rapidly when well grown that one can safely assume that the day is drawing near when the saturation point is reached in the cut flower market, unless very radical changes take place in charges for flowers to the public, bringing a large group of new purchasers into the field. When this day comes, the professional and semi-professional grower will slowly divert his attention to the sale of plants rather than flowers. That is the day to which I look forward, and the day when divi-

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The Native Orchids of the County of Cumberland, New South Wales

Rev. H. M. R. RUPP, *Northbridge, N.S.W.*

The County of Cumberland occupies an area within a line drawn from Sydney southward to Bulli, thence westward to the foot of the Blue Mountains, thence north through Penrith and Richmond, then following the Hawkesbury River to its mouth, and so southward again to Sydney.

Within this area 119 species of Orchids are definitely on record — 102 terrestrials and 17 epiphytes. It is unlikely that more than 100 could be found to-day. Many localities formerly covered by bush are now more or less densely populated, and others have long been cleared for agricultural or grazing purposes. Nevertheless, there still remain large tracts of land comparatively untouched by the relentless march of human settlement. Chief among these, of course, are the two great national reserves—Kuring-gai on the north of Sydney, and National Park on the south. Smaller reserves, and unoccupied stretches of country, too rough or otherwise unsuitable for settlement, are also available as hunting grounds for the lover of our native Orchids.

The 17 epiphytes occur principally along the course of streams or gullies near the coast. A few of them are not, strictly speaking, epiphytes at all, but rock Orchids; we may let that fact pass with a bare mention. They comprise the following species:

Liparis reflexa, Dendrobium speciosum, D. gracilicaule, D. aemulum, D. tetragonum, D. pugioniforme, D. linguiforme, D. teretifolium, D. striolatum, Bulbophyllum crassulifolium, B. exiguum, Sarcanthus tridentatus, S. Beckleri, Sarcochilus australis, S. olivaceus, S. Hillii, Cymbidium suave.

Liparis reflexa is common on rock ledges in many places: it is not unattractive in the mass, but the flowers have an objectionable odour. *Dendrobium speciosum*, the so-called (and miscalled) Rock Lily, was once very abundant, but has been sadly reduced in numbers. Rarer still now is *D. gracilicaule;* but in the National Herbarium there is a Port Jackson specimen collected by Betche in 1887. *D. aemulum* was recorded by Blakely near Hornsby as recently as 1936. It is a beautiful little species when in flower. *D. tetragonum*, with its quaint quadrangular stems, I have only seen recorded from southern parts of the County, but it may occur in some of the Kuring-gai gullies, as it is plentiful in many localities north of the Hawkesbury. *D. pugioniforme*, the Dagger Orchid, is in National Park, and not many years ago was still in evidence near Mosman Bay. *D. linguiforme*, the charming little Tongue Orchid, may be found creeping on rocks in many localities. *D. teretifolium*, with its drooping feathery plumes of flowers, still adorns the trunks of Swamp Oaks about Narrabeen Lakes, National Park, and other places. *D. striolatum*, one of the smaller Pencil Orchids, is exclusively a rock plant; it may be seen in National Park, and still survives towards the head of Lane Cove River. The two species of *Bulbophyllum* are inconspicuous creeping plants, growing on rocks or trees in sheltered gullies. *Sarcanthus tridentatus*, the Tangle Orchid, used to abound in some of the Middle Harbour gullies, but I have not seen it there for a long time. Its tiny relative, *S. Beckleri*, is recorded by Mr. E. Nubling in National Park. Both these have very fragrant flowers. *Sarcochilus australis*, a veritable gem among our smaller epiphytes, may be sought on branches of the water-gums in deep gullies. *S. olivaceus*, with fragrant racemes of golden-green, seems now to be rare outside National Park. The tiny *S. Hillii*, also very fragrant, is not really uncommon, but easily escapes observation. *Cymbidium suave*, a really attractive Orchid when well-grown, was once quite common, but has gradually disappeared in many areas. Fitzgerald's unpublished plate of this species shows a good specimen from Cook's River — a locality where one would hardly go Orchid-hunting to-day.

The terrestrial Orchids are more widely distributed than the epiphytes, and in practically every part of the County where bush or open grasslands occur, at least a few of the 102 species may be found. Flowering times are difficult to define, but members of the following genera are exclusively springtime flowers: *Thelymitra* (Sun Orchids), *Diuris* (Doubletails), *Calochilus* (Beardies), *Lyperanthus, Burnettia, Caladenia* (with the exception of *C. alba*, which often appears earlier in the year), *Glossodia, Galeola, Gastrodia.*

The following terrestrials have been definitely recorded in the County in past years, but are now either extinct here, or are so rare as to escape discovery by present-day observers: *Diuris* *alba* (Riverview), *D. aequalis* (Liverpool), *Prasophyllum australe* (La Perouse), *P. reflexum* (Jamberoo and Dural), *Caladenia Fitzgeraldii* (Gladesville), *C. filamentosa* (Manly and Como), *C. deformis* (Como), *Pterostylis barbata* (Maroubra).

The 102 species recorded are distributed among 23 genera, thus: *Thelymitra*, 9; *Diuris*, 8; *Orthoceras*, 1; *Microtis*, 3; *Prasophyllum*, 25; *Caleana*, 2; *Spiculaea*, 1; *Chiloglottis*, 3; *Acianthus*, 4; *Calochilus*, 3; *Eriochilus*, 1; *Rimacola*, 1; *Lyperanthus*, 2; *Burnettia*, 1; *Caladenia*, 9; *Glossodia*, 2; *Corybas*, 4; *Cryptostylis*, 3; *Pterostylis*, 16; *Galeola*, 1; *Gastrodia*, 1; *Spiranthes*, 1; *Dipodium*, 1.

The familiar Sun Orchids (*Thelymitra*) are fairly well represented. The commonest species, which is also the largest and the most beautiful, is *T. ixioides*. In my opinion, a well-developed flowering-spike of this lovely blue Orchid is hard to beat, and I know of no locality where finer specimens can be found than in County Cumberland. The species has a wide range, being recorded in all Australian States and in New Zealand. Another beautiful species is *T. venosa*. The typical form is not large, but *var. magnifica* is a splendid flower. It is only known from two localities, one in this County near the top of Bulli Pass, and the other on the Blue Mountains about Wentworth Falls and Leura.

The Doubletails (*Diuris*) constitute a very attractive group of Orchids, easily recognised by the lower sepals, forming two deflexed "tails" below the rest of the flower. The majority are yellow with brown markings; but *D. punctata* is a charming flower of lilac tints. It appears to be rare now in this County, and doubtless has suffered from the vandalism of careless wild flower gatherers. It extends to Queensland, Victoria, and South Australia. *D. maculata*, yellow with heavy brown blotches, is common in the early springtime. *D. aurea*, golden yellow with faint brown marks, does not attain the dimensions here which are met with further north on the Lower Hunter and about Bullahdelah. It is confined to the northern half of this State and Southern Queensland. *D. sulphurea*, very variable in size, can be recognized by its sulphur yellow flowers with two dark brown blotches on the upper sepal, and a dark brown band across the labellum. This band is absent in *D. brevifolia*, which is otherwise rather similar.

Orthoceras strictum, sometimes called "Straight-horns," is closely related to *Diuris*, but lacks the large petals of the latter, and the lower sepals, instead of hanging down like tails, are erect, forming the "horns." It blooms in late spring and summer, and is sometimes over three feet high. The colouring is unattractive—dull brown or greenish. It was first discovered in New Zealand, where it was originally named *Diuris Novae-Zealandiae*.

The species of *Microtis* here are all inconspicuous plants, with very small green flowers in spikes. *M. oblonga* has a mild perfume, resembling that of *Boronia megastigma*.

Prasophyllum is the largest of all Australian Orchid genera, having upwards of 80 known species. Though in most cases the flowers are small and inconspicuous, these Orchids are of great botanical interest. The flowers are reversed, the lower sepals being on top above the labellum and dorsal sepal; in a few species they are united for the whole or part of their length. So far as the New South Wales species (of which there are 44) are concerned, the genus is conveniently divided into two sections—*Euprasophyllum* and *Genoplesium*. The former are relatively large plants, in the case of *Prasophyllum elatum* actually recorded as reaching a height of six feet, though I think four feet would probably be the maximum about here. The *Genoplesium* Section, which is more strongly developed in New South Wales than anywhere else, consists entirely of diminutive, slender plants with spikes of tiny flowers. A real "Orchid-eye" is necessary to detect these pygmies. But could their flowers be increased twenty- or thirty-fold in size, no treasured exotic epiphyte would be more sought after; for, seen under a powerful magnifier, these little flowers reveal unsuspected and astonishing beauties of design and colouring. I have not time to go into details, but I hope to be allowed some day to give a special talk or paper on the Pygmy Prasophylls, no less than 19 of which have been recorded for County Cumberland.

The Bee or Duck Orchid, *Caleana major*, is no doubt familiar to most of us. Fitzgerald, with his artist's dislike of straight lines, shows it with its slender stem gently undulating, but in my experience of this very interesting species, extending back over 50 years, I have never seen it display this character unless the stem had been obstructed by undergrowth or fallen twigs. It is usually perfectly straight. The floral structure is remarkable and of much interest. *C. minor* is a smaller species, of paler colour than its deep red-brown relative; it is less common, although it has a more extensive habitat, being found in New Zealand.

Nearly related to these is the quaint little Hammer Orchid, *Spiculaea irritabilis*, with its hammer-like labellum articulate on the long foot of the column. "Irritabilis" is a misnomer, as the labellum is not irritable, but is easily moved about by wind. This Orchid may be found in the sandy scrubs about Collaroy and Narrabeen, flowering in the summer.

The three species of *Chiloglottis* are all similar plants, with a pair of leaves nearly flat on the ground. They are distinguished chiefly by differences of shape and arrangement in the curious glands on the labellum. One—*C. reflexa*—flowers in the autumn, the others in the spring.

Of the four species of *Acianthus*, *C. caudatus* is the most interesting. The flowers are usually deep reddish-purple, the sepals being filiform, and the dorsal one much longer than the others. The single leaf near the base of the stem is cordate, and reddish underneath. The flower has a rather objectionable odour. *A. fornicatus* is the tallest member of the genus, sometimes exceeding 12 inches. It is very common in coastal bushlands.

The genus *Calochilus*, as its name implies, is notable for the beautiful labellum of nearly all the species, densely beset with long red, purple, or blue hairs, shining with a metallic lustre. Of the three species recorded here, *C. paludosus* is perhaps the most attractive.

Eriochilus cucullatus, sometimes called Parson's Bands, is a small autumn-flowering Orchid, pink or white, with the two lower sepals conspicuous.

Rimacola elliptica is one of our most curious and attractive Orchids. It is only found in damp (or even very wet) crevices of rocks in the Central Coastal and Central Tableland areas of this State. It was originally named by Robert Brown *Lyperanthus ellipticus*, but a few years ago I ventured to make it the type of a new genus, *Rimacola* (dwelling in crevices). Its affinities with *Lyperanthus* appear to me to be slight. It bears racemes of verdant-green flowers, usually drooping from the crevice where the plant grows.

Of our two species of *Lyperanthus*, *L. nigricans* is the more interesting. It prefers a peaty soil in sandy heathlands, and has a solitary, thick leaf, roughly oval, flat on the ground. The flowers are translucent white, heavily streaked with deep purplish-red; but the whole of the plant turns jet-black directly it is pressed and dried. *L. suaveolens* is a taller plant, with a long, hard, blade-like leaf and reddish or yellowish-green flowers, which on warm, sunny days have a pleasant perfume.

Burnettia cuneata is a rare, small orchid allied to *Lyperanthus*. It is recorded from National Park and the summit of Bulli Pass.

Of the nine Caladenias, three are now extremely rare, if not extinct, within the County, *C. Fitzgeraldii*, *C. filamentosa*, and *C. deformis*. To these, I fear, we must soon add *C. dilatata*, which Mr. P. A. Gilbert tells me he used to find about Beverly Hills, and of which we have old National Herbarium specimens from Gladesville, Canterbury, and Cook's River. Only four of the attractive and intriguing "Spider" *Caladenias* have been found in the County, and of these only the smallest, *C. tesselata*, is still moderately plentiful in certain areas. Of the other *Caladenias*, *C. carnea* and *C. alba* are abundant in many localities, the former being very variable but easily distinguished by the red transverse bars on labellum and column. *C. caerulea*, though small, is one of the gems of our orchid flora. The flower is sky-blue, the labellum having transverse red lines and rows of golden, yellow-headed calli.

Our two species of *Glossodia* are fairly well known—*G. major* with large mauve flowers, and *G. minor* with small violet flowers. White specimens of both are sometimes found.

The various species of *Corybas*, small though they all are, are among the most delightful little floral treasures of our bushlands. The little helmet-shaped flower, usually purple with greyish or reddish tints, is set close to the prostrate circular or heart-shaped leaf. In all the Australian species of this genus, the dorsal sepal and labellum are developed out of all proportion to the other segments, which are almost rudimentary. Our four species may be looked for in sheltered forests from April to June.

Cryptostylis subulata and *C. erecta* are two attractive species well worth trying in pots. They flower in late spring and summer, and often occur in boggy places. *C. leptochila* is a species with very attenuated flowers; so far as I know, within County Cumberland it is restricted to the National Park.

The Greenhoods (*Pterostylis*), in spite of their failure to rise to great heights in the matter of colour, are to manv people the most fascinating of all our terrestrials. Green is the prevailing colour, but in a few species red-brown is conspicuous. The so-called "King of the Greenhoods," *P. Baptistii*, is recorded from Oatley, Penshurst, La Perouse, Parramatta River, and Narrabeen, but the last-named is the only locality where it has been seen of late years. It is a noble flower, sometimes three inches long, green with delicate fawn bands. *P. grandiflora*, though not, as its name might suggest, the largest of the Greenhoods, is perhaps the most beautiful, with its rich red-brown tints. Several other species deserve mention, but time will not permit. We have 16 altogether.

Galeola cassythoides is one of the two "Climbing Orchids" found in New South Wales. It ranges northward to Queensland from Illawarra. Its leafless stems attach themselves to tree-trunks by means of aerial sucker-like roots, attaining occasionally a height of 20 feet, but probably not exceeding ten feet in the County. It produces an immense number of golden-brownish flowers with white labellum. It is not amenable to cultivation. (Its larger relative, *G. foliata,* which does not come south of the Macleay River, has been known to reach 40 feet, and bears literally thousands of fairly large golden-yellow flowers.)

Gastrodia sesamoides, the Potato Orchid, is not particularly attractive.

Spiranthes sinensis is the only representative in Australia of a fairly large genus which reaches its greatest development in America. It is a charming summer-time Orchid of bogs and swamp-lands, with a bright pink spike of spirally-arranged flowers.

Last but not least is another summer bloomer, the Hyacinth Orchid, *Dipodium punctatum.* This Orchid, often very beautiful, and sometimes attaining a height of three feet, or even more, with as many as 60 blooms, has adapted itself to a remarkable variety of conditions. I have collected it along D'Entrecasteaux Channel, south of Hobart, and I have received it from the Northern Territory and North Queensland. I have seen it growing at sea level and at a height of 3,500 feet; in raw sand, in shale, in rich red soil, and in heavy black soil. Yet in spite of this extraordinary adaptability, we have not yet learnt how to cultivate it—it may thrive for one season, but personally I have not heard of its successful cultivation beyond that.

I have only given you a fleeting glimpse of the Orchid Flora of the County in which we live, but I trust it will have sufficed to show how much there is for us who love the Orchids to find and to study within easy reach of our homes.

In his handbook "Plants Indigenous in the Neighbourhood of Sydney" (1880), W. Woolls records *Bulbophyllum minutissimum F* v M. In "The Orchids of N.S.W., H. M. R. Rupp, (1943) says, "The species extends at least as far south as Port Jackson." The species should be included in Mr. Rupp's tabulation. Woolls also records *Caladenia Patersonii* R.Br., which also may be included among the locally extinct species.—Hon. Editor.

● Mr. C. C. Hildebrandt won first prize for the "Best Coloured *Cymbidium*" with *Janette,* at C. H. Deane's Orchid Exhibition, 1944.

Orchids — the War and the Future

Continued from page 56

sions of the best varieties will be readily available to lovers of the cult at reasonable prices.

Why do I welcome the prospect of a glut in flowers? I have never forgotten Burnham Beeches the year following the removal of their Orchids from Melbourne! In February of that year I saw between 250 and 300 *Cattleya* flowers in the one house. These flowers were all of superb varieties and growing on plants, many having bulbs 24 inches high and 2 inches thick. Later the same year, I saw upwards of 250 spikes of *Cymbidiums* all out, some upright, some horizontal, others pendulous. Many of the finest *Cymbidiums* in Australia were included, and the beauty of this varicoloured display was quite beyond my descriptive capacity, but I have never forgotten it, and I hope for the day when most of us will be able to stage a similar show of our own. Here we get the real reward for our labour and expense, and if we are to develop the cult to its real potential, we must allow those who at present are not interested, to see such displays, and also to appreciate that the fable that Orchids are hard to grow is nothing but a myth. Should this ever happen, our professional growers will reap a far greater reward from plants than they have ever got from flowers.

Since this article deals largely with the future, it would be wrong not to express my confidence in the ability of many of our growers to produce seedlings, and I urge all growers who have outstanding varieties of *Cymbidiums, Cattleyas,* and "Slippers" to make seed pods, and to make the resultant seed available to those experimenting on propagation. Locally produced seedlings are the best method of supplying Australian growers at reasonable prices, for the shipping and landing charges from England, together with the loss factor both in plants and acclimatisation make even a cheaply priced plant dear. Simultaneously, if you wish you can produce a few seedlings yourselves by planting around parent plants. It is a hopeless waste of time to make a cross not likely to give something better, but you can help a lot by providing a pinch of good seed to those trying to develop the art of growing Orchids from seed in this country. In no way will you more thoroughly ensure adequate supplies within Australia.

The Natural Climate of the Modern Hybrid

R. BRUCE HOGG, *Brunswick, Vic.*

● What climate is natural to the various Orchids we grow? We know that *Cymbidiums* and "Slippers" come from India and Malaya, and *Cattleyas, Odontoglossum,* and *Miltonias* from America. Different varieties of these various species, grow under conditions in great contrast, elevations varying from near sea level to 10,000 feet, giving a great variety in temperature and humidity. Some are subject to a rainy and dry season, particularly those from monsoon districts, while some are more or less continuously wet. Some grow under the shade of dense forest, while others are high up on trees fully exposed to the sun. I have heard many enthusiasts say that we merely require to reproduce the natural conditions of the country to which they are indigenous to get results, but this would require a glass house for nearly every plant. The genius does not exist who could keep one house at the equivalent of 2,000 to 10,000 feet elevations simultaneously, neither is it possible to give bright sunlight and dense shade at the same time, nor monsoon and dry conditions together.

So much for the conditions in which the various species grow in their natural habitat. I am sure that my readers will agree that we cannot possibly reproduce natural conditions, and must thus give the plant "happy" conditions not necessarily similar to Nature, and that to a large extent we succeed, and in many cases we make the plants more happy than Nature does. The real purpose of this article is to debate the question —"What is the natural climate of the modern hybrid?" I have often discussed this question with growers, particularly in Sydney. In regard to *Cymbidiums,* they have claimed that since the Sydney climate is not unlike the climate in India where they grow, they should do best in the open in Sydney's climate. I admit that there is a similarity in climate in regard to the species and will concede that species should do well in the open, but is the climate similarly natural to hybrids?

The modern hybrid Orchid is the product of many generations under glasshouse conditions where light, water, heat and air are under control, and I suggest that the natural climate of the hybrid is the climate of the glasshouse in England in which it was bred, and that if taken to India and grown under the conditions to which its forefathers were subject to, the probability is that it would be very unhappy, to say the least. Similarly, if we sent the modern *Cattleya* hybrid to Central or South American mountains, it would probably die.

We are told from America that the natural life of a *Cattleya* species is only a few years, without doubt this is due to living under unnatural conditions. We know that the modern hybrid *Cattleya* properly grown under glass is practically everlasting.

Nature has a strange, but very necessary power of helping each succeeding generation to adapt itself to a change in climatic conditions, and after many generations, changes the susceptibilities of the subject to such an extent that the new conditions become the natural ones. In this connection I ask if the children of American negroes were sent back to the climate their forefathers came from in Africa, would they thrive; the answer is No. They would contract many forms of disease, the ability to resist which had been lost by many generations under entirely different climatic conditions. Their natural climate to-day is undoubtedly America. So also is the natural climate of the hybrid Orchid that of the glass-houses of England and not the tropical mountains. They have not met a rarified atmosphere or faced the trials of a monsoon or drought for many, many generations, and would probably die if subjected to them.

The probability is that many generations under entirely different climatic conditions have brought about constitutional changes which make its new climate its natural one, and that if exposed again to its old climate, a long period of reacclimitisation would be necessary.

The whole of the foregoing is set out solely in the constructive sense and from it I express the opinion that Orchid hybrids should be grown under conditions similar to those in which they were bred in England with modifications in shade and ventilation to adapt conditions in the glasshouse to meet the atmospheric and climatic difference between our climate and that in England. The compost should vary according to climate, for if sun heat must be countered by more water than in England, the compost should be more open and better drained.

Since I have shown that the natural climate of the modern hybrid is one produced under glass where complete control of heat, light, humidity, ventilation and water exists, a hybrid is growing under unnatural conditions in the open where this control does not exist.

The Enemies of Orchids in North Queensland

A. GLINDEMAN,

● There are many different ways in which Orchids and Orchid fibres are destroyed in this district, which I daresay includes other districts that I know nothing about. Here are a few ways in which Orchids are destroyed:—

First, and foremost, bushfires. In North Queensland there are two seasons—"wet" and "dry." The dry season is from June to December, and the wet the other months of the year. The first months of the dry season are good, as the grass is too green to burn, and there are very heavy dews, which keep the grass wet for the greater portion of the day, and then, as the dry season advances, so the dews get less, until eventually there are no dews—then the bushfires commence. These fires burn down the trees which are the hosts of the Orchids and Polypodium fern, and once the tree is on the ground the Orchids and fern die. Polypodium fern fibre will smoulder for days, until the whole fern is a charred mass, and there goes your potting compost. Orchids using trees as hosts will not live on the ground.

In this mountain range country it is necessary to burn the old grass for growing purposes, as stock will not thrive on the old frosted and dry grass, and the cattlemen get busy with matches—hence the bushfires. Usually the big "wets" bring big bushfires when the dry season comes, and the big fires scorch the plants to a height of thirty feet or more in the trees. *Dendrobium fusiforme* is a great sufferer from bushfires. I have seen thousands of plants killed by bushfires in this district. *D. fusiforme* only grows in the range country, and only over a narrow belt of country, so every year this species becomes less.

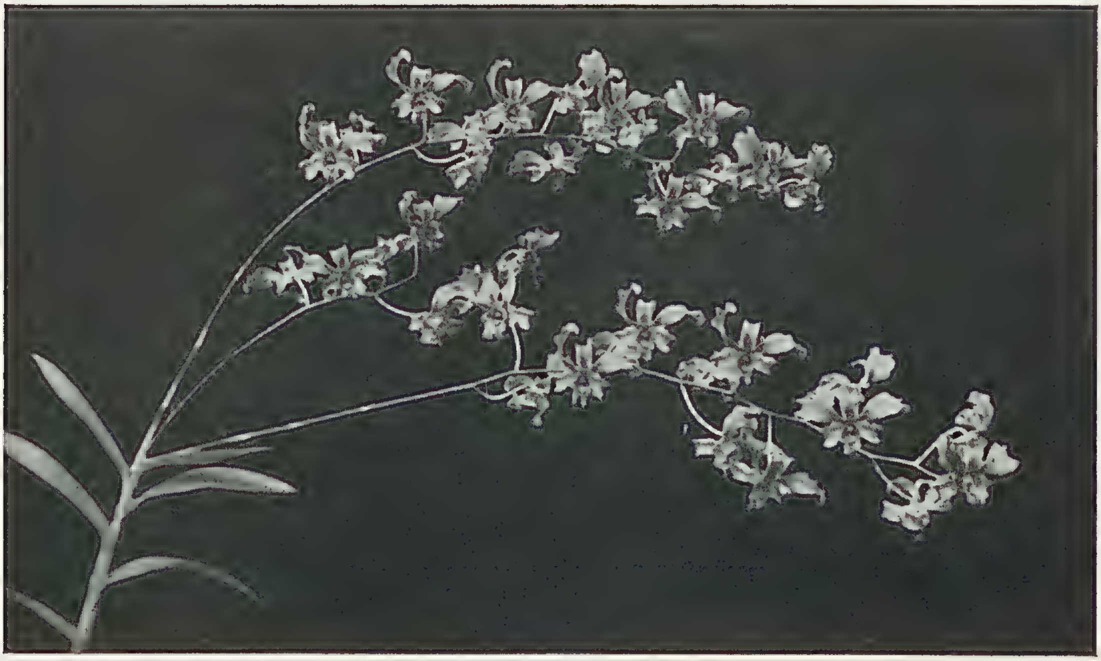
Then another wholesale slaughter of Orchids is by the timber cutter. In the rain forests great trees are felled for different commercial uses. Some of these trees have up to 7,000 feet of timber in them, so you can just imagine the amount of forest trees which is destroyed when they are felled. High up in the branches and crotches, Orchids and Polypodium ferns repose. When the tree is felled, all this plant life is destroyed. Timber men do not even notice an Orchid or fern. Any plant life adhering to the tree is considered just a nuisance.

Now we will come to the Osmunda swamps. Here the noble *Phaius Tankervilliae* usually grows with its four- to six-feet flower spike of scented flowers. Here the cattleman's herd takes toll of this beautiful Orchid. In the dry season the swamps dry up considerably, and the cattle brave the bogs to go after the green swamp pastures, and the *Phaius*, being a nice green plant, is readily devoured. Cattle are particularly fond of the flowers of *Phaius Tankervilliae*. I promised a friend some flowers of this *Phaius*, and when I came to the swamp where it was growing and in flower, to my disgust there was a mob of cattle having breakfast on my lovely flowers. I had to go some four miles to another batch of plants to fulfil my promise.

Hundreds of plants of *Phaius* are destroyed in very dry seasons by cattle, and sometimes these swamps, in a very dry time, burn by bushfires. Bushfires are very destructive to the Osmunda fern. There is one good thing, it is seldom dry enough to burn the Osmunda swamps, otherwise the Osmunda fern would be exterminated. In digging Osmunda fibre you do not interfere with the fern life, as you take the fern roots, which is your potting medium. You leave the fern in its growing position, and it still grows on and in two years' time it has another crop of fibre. This second crop is much finer than the first crop, and therefore is a better potting compost. This area in which the Osmunda fern grows is very limited. I have wandered over nearly all of Queensland and the Southern States, and have only noticed it in the Mt. Fox range country.

Polypodium fern covers a much larger area of country. Sanders write in their Orchid Guide that unfortunately Polypodium fibre supplies are exhausted in that country (England) so they use the next best thing—Osmunda fibre. This is not the case in Australia, as we have plentiful supplies of this potting medium.

Now back to Orchid destruction again. In the drier Orchid country, the granite belt, a few species of Orchids grow, and here the Wallaroo devours them in dry seasons. This animal, I presume, eats the Orchids for the water they contain. The species are *Dendrobium speciosum*, a few large-sized plants of *Dendrobium undulatum*, *Dendrobium teretifolium*, and a large-sized species like *Sarcochilus Cecilae*, with very



DENDROBIUM SUPERBIENS, *Rchb. f.*
Grown by R. Grant, Mackay, Qld.

dark-coloured flowers. All these species that I have mentioned grow on granite boulders away from the rain forests. It is surprising how Orchids will grow on bare granite rocks right out in the full sunlight.

Wallaroos, being large-sized marsupials, and frequenting the granite rock country, relish the Orchids which grow on rocks. Then you have a parasite in the form of scale, that destroys in certain districts large numbers of plants, chiefly *Cymbidium canaliculatum*. Then there is a beetle borer, which bores into the bulbs of *Den. speciosum*, and destroys large numbers of plants.

Another destructive parasite is the human vandal, who comes along in a motor car, and when he sees Orchids in flower, he just pulls them from the trees and fills his car, then drives home again. When he gets home he realises that these plants will take a lot of energy to fix up, so he tries tying one or two to a dry verandah post with a piece of string, and expects them to grow. The rest are eventually thrown away.

When *Phalaenopsis Rosenstromii* was rediscovered midway between Townsville and Ingham, the vandals got busy, and hundreds of plants were taken from the mountain jungles and distributed around to people who did not know an Orchid from a water-lily, and it is quite safe to say that not a plant survived. I, myself, bought a plant of this *Phal. Rosenstromii* which adorned a dry verandah post in the full sunlight in tropical Townsville. The chap I bought it from told others about the "mug" he struck, who paid him ten shillings for this Orchid plant. This came back to me when I returned from Brisbane.

However, these are a few of the ways in which Orchids, and Orchid fibres, are destroyed in this district that I live in—Mount Fox.

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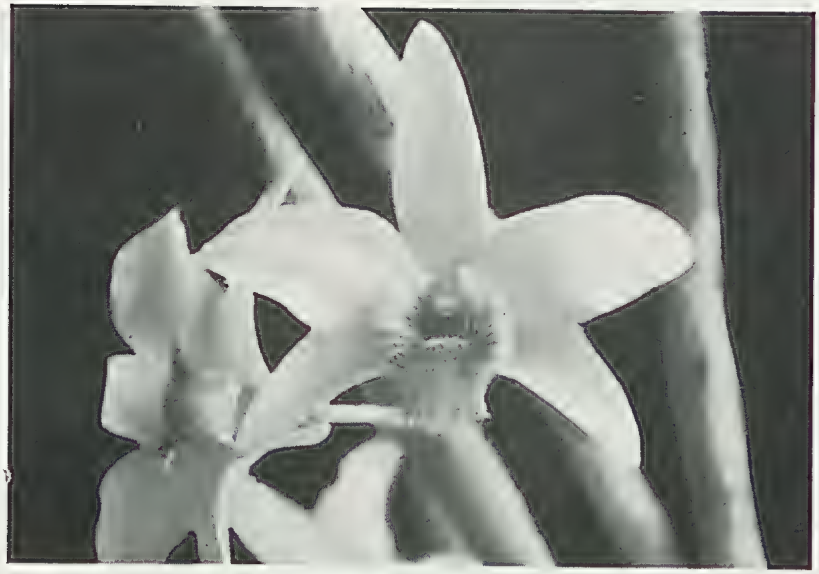
Our Wild Orchids (North American Orchids), F. Morris and E. A. Ames.

Cultural Table of Orchidaceous Plants, for Australian conditions, J. Murray Cox.

Orchids, Watson and Chapman.



DENDROBIUM HETEROCARPUM *Wall.*
Grown and photographed by P. A. Gilbert.

Orchids for Amateurs, T. W. Briscoe (two copies).

Orchid Grower's Manual, 7th edition. B. S. Williams.

Sander's List of Orchid Hybrids, in parts to 1940.

American Orchid Culture, E. A. White, 3rd edition (donated by Mr. W. Fahey).

Australian Orchid Review, bound in three volumes, complete to 1942; also Vol. 1, only.

Orchids of New South Wales, H. M. R. Rupp, 1943.

Guide to the Orchids of New South Wales, H. M. R. Rupp, 1930, two copies.

Victorian Naturalist, monthly from 1936.

Australian Orchids, R. D. Fitzgerald (for references purposes only).

Miscellaneous periodicals (foreign).

● Editorial matter, M.SS., and photographs, should be sent direct to P. A. Gilbert, Hon. Editor, *The Australian Orchid Review*, 37 Colin Street, Lakemba, New South Wales.

● *Two New Records for Queensland.*—The energetic pursuit of native Orchids which Dr. A. J. Russell, of Melbourne made, when he was in Queensland on active service, brought to light two plants hitherto unrecorded for this State.

The first, which came from the foothills of Mt. Glorious, near Brisbane, was a tiny plant which bloomed in my bush-house early in August, and proved to be *Sarcanthus purpuratus* (Rupp) Rupp, previously recorded only for the North Coast and adjoining highlands of New South Wales. The species is very closely allied to *S. Beckleri* (F & M) Rupp.

The second plant, *Dendrobium tetragonum*, Cunn var. *Hayesianum*, Gilbert, came from the Tambourine Mt. district, south of Brisbane. The flowers of this variety equal in size the smallest forms of the type and have a pale yellow perianth with a cream or white labellum, and are devoid of any other markings.—Trevor G. Hunt, Ipswich, Qld., 23/10/1944.

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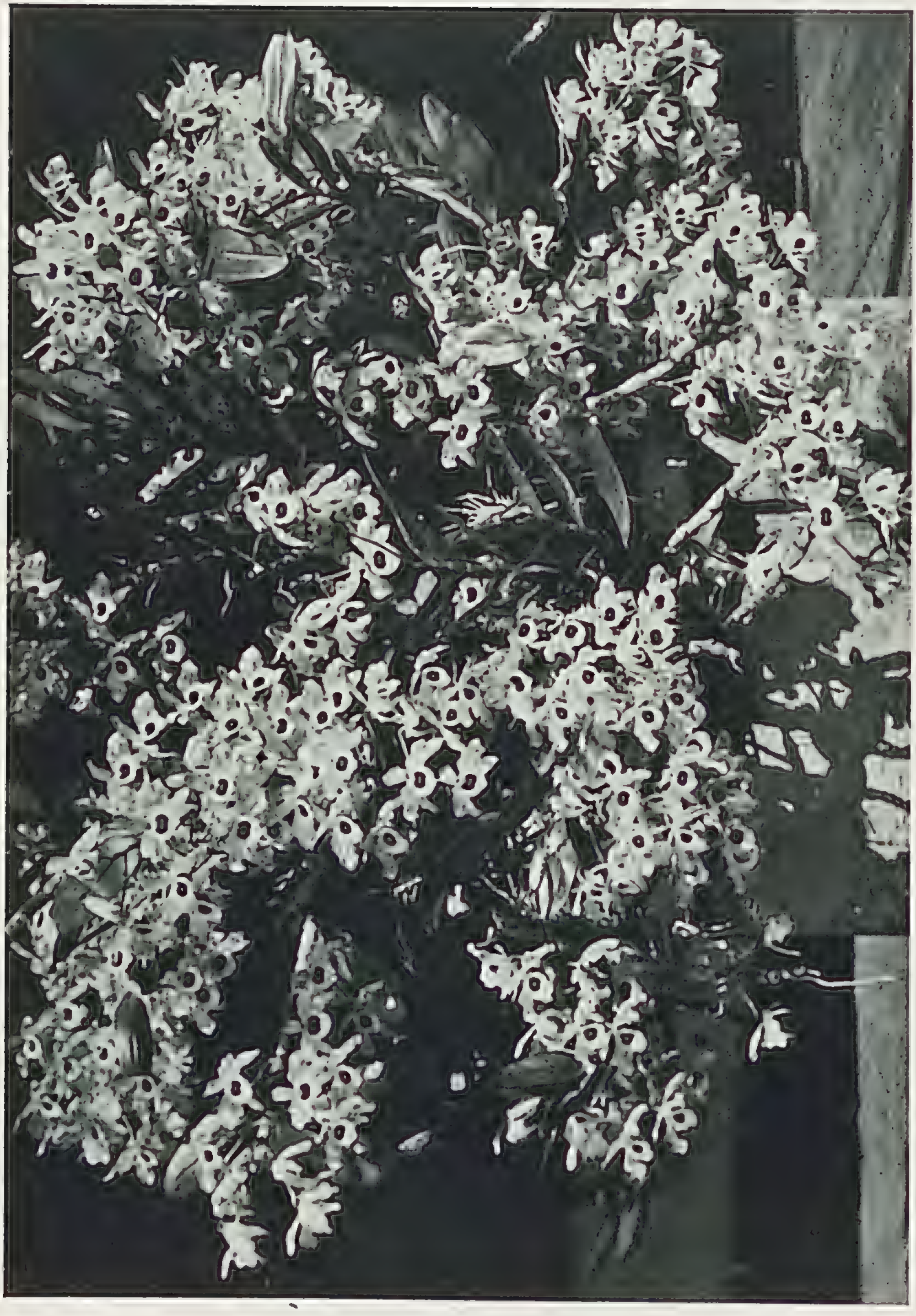

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780 flowers. Grown on a verandah in a mixture of clay and wood chips at Mallanganee, via Casino, N.S.W.

By courtesy of G. Cruickshank.

The Modern Cypripedium

R. VICK, *Canterbury, Vic.*

PART I.

R. Vick, Canterbury, Victoria.

● This hardy popular Orchid nowadays reveals size, form and beauty once not even dreamed of. Just as the rose and the dahlia have been developed by hybridists from the relatively few and small flowers of original species, so has the "Slipper." As for size, *Cypripediums* seven inches across have been raised. If memory serves me right, *Major Hanbury Carlile* was one of these, while *Atherton Giant* from it was "gigantic," and *Wengen* "very large." However, just as the oversize dahlia has had a relatively short lease of popularity, so, too, will it be probably the case with oversize *Cypripediums*. Far from condemning the raising of these, one must realise that frequently they can be made good use of by the skilled hybridist. In a collection one does not look for, nor desire, uniformity of size, as the daintiness of the small flower contrasts with the boldness of the large one, and blends with the average one to make a display of variety and beauty. Latest information from England seems to indicate that breeders there are now concentrating more on form, character, quality and colour than on large size, flowers exceeding four inches being considered in the out-size class.

Form, naturally, is most important, and is receiving more and more attention. Breeding from flowers of good form must ultimately result in a greater percentage of flowers approaching the ideal aimed at. What is this ideal? Two or three flowers may be taken to indicate a close approximation to the apparent ideal of the present-day breeders. *Diana Broughton* var. *Alcestis* F.C.C. R.H.S. England (see English Orchid Review, 1938, for illustration) has both dorsal and ventral sepals well rounded, symmetrical and balanced. The petals are wide, not too far forward, and nicely waved and balanced. Both sepals and petals form a shell shape, with no wide spaces between them. A proportionate nicely formed pouch completes the balance and symmetry as a whole.

Cyp. John Keeling, too, is an almost perfectly shaped flower, in which the lower sepal wraps over the large round dorsal so that the latter cannot possibly reflex near the base, as often occurs. The petals and the pouch, too, are of such form and proportions as to complete the unity of the build of an ideal flower.

Cyp. Aylesbury var. *Picture* A.M., described in the English Orchid Review, 1940, is a third example of the high standard of form required by English judges. This flower has a big, broad dorsal, fine wide petals well-placed and balanced, a ventral sepal of very good size and shape, and a pouch well balanced in proportion.

With size and form must go beauty. Here, too, great improvement is evident. Hybridising has resulted in the appearance of beautiful shades of colour—green, cream, yellow, rose, purple, brown, black, etc., not to mention the delightful porcelain white.

Aylesbury is described as having a big, broad, white dorsal, very heavily spotted with glistening blackish-purple. The lower half of the petals is green and brown, with the green portion spotted purple-brown, while the upper half is brown. A green rim runs round the mouth of the purple-brown pouch. A beautiful combination of colours!

John Keeling has the centre of the dorsal dark green with very dark spots, the edge a very clean white and most effectively and beautifully goffered. The petals and pouch are reddish-brown.

Diana Broughton F.C.C. is a lovely creation, having the base of the dorsal honey-yellow in colour, with a wide white margin. The ventral is somewhat similar, while sepals and pouch are also honey-yellow.

Bright and distinct colourings give bold and striking effects, while dull, washy or smeary colours detract considerably from the attractiveness of the "Slipper," no matter how good size and form may be. If to size, form, and colour we add substance, character and good growth, each of the highest quality, we have the modern *Cypripedium* of class.

These three flowers have been taken as typical of the highest class of *Cypripedium* in vogue to-day. Whence come they? This can be revealed only by a study of their genealogical tables. Take firstly, that of *Aylesbury*. A glance at the table will show that here we have a flower of the eighth generation, having 21 blood-lines of *insigne*, 19 of *Spicerianum*, and 19 of *villosum* (*Boxalli*), so blended that we have 15 of *Leeanum*, five of *Euryades*, three of *Alcibiades*, and three of *Eurybiades*. Note particularly the prevalence and balance of the blood of the three mentioned species.

Diana Broughton, also an eighth generation product, needs studying in detail to see how a flower of such a different colour has been bred.

In its veins run 13 blood lines of *insigne*, plus five of *insigne Sanderae*, 14 of *Spicerianum*, and 12 of *villosum*. *Leeanum* appears eight times, as does the yellow form, *Actaeus*. Note in the later generations the use made of *Glorita*, *Moonlight*, *Florence Spencer*, *Gwen Hannen* and *Phantasy*. Then was it any wonder that the yellow, white-tipped *Doris Black*, when crossed with the yellow and white *Grace Darling*, should produce the beautiful forms of *Diana Broughton* that have appeared!

John Keeling was derived by crossing *Warrior* with *Mrs. Eley* var. *Rosemary*. Reference to the pedigree table will show that there are seven lines of *insigne* blood, six of *Spicerianum*, and five of *villosum Boxalli*. An interesting point is the presence of six lines of *Leeanum*, and two each of *Alcibiades*, *Lord Wolmer*, and *Warrior*.

To assist readers in understanding more clearly the next section, a brief description of some of the species originally used may be helpful. I would suggest that interested readers trace the colour influences of these species as revealed in the descriptions of the three hybrids named above. Better still, take the flowers of these species and compare them side by side with some of the modern *Cypripediums* when in flower, and thereby try to trace the dominant and recessive characteristics that have influenced colour, form and size.

C. insigne has green dorsal with brown-purple spots at centre and base, white at apex; petals yellowish-green, shaded brown-purple; *insigne Sanderae* is its yellow form.

C. villosum has green dorsal, purple base and centre, then green with narrow white margin; petals, top half, yellowish brown; lower, paler. In var. *Boxallii*, dorsal is heavily spotted black-purple, with white margin; petals greenish-yellow with red-brown markings.

C. Spicerianum has pure white dorsal, green at base, with purple median stripe; petals pale green, marked and spotted purple; lip brownish-purple.

C. callosum has white dorsal, shaded green at base, striped and often flecked dark crimson; petals pale green.

C. barbatum has dorsal green at base, white flushed with purple; petals ciliate at edges, black-warted on upper edge, purple at apex; lip brown-purple.

C. Fairieanum has white dorsal, yellowish-green at base, veined purple; petals deflexed, recurved, ciliate; lip reddish-green, veined purple.

PART II.

The first article was concluded with a brief description of half a dozen of the species. The blood of these is found more frequently than that of other species in the modern hybrids. As exemplified by the pedigrees of *Diana Broughton*, *John Keeling*, and *Aylesbury*, the three species chiefly used were *insigne*, *Spicerianum* and *villosum* (*Boxallii*). To emphasise this still further, it may be noted that these blood lines appear in the following well-known hybrids of different colours in the proportions set out below:—

Name of Hybrid	Colour	*insigne*	*Spiceranium*	*villosum*
Gertrude West	Green	7	6	8
Grace Darling	Yellow	11	7	5
Mem. J. H. Walker	Reddish	2	3	3
Gwen Hannen	White	2	3	2
Chrysostum	Light	5	5	2
Rishworth	Bold purple blotches	5	2	4
Wendover-Roseum	Deep rose	7	4	5

While the work of the hybridist in the early stages was slow (due to the lack of knowledge of present scientific methods of germination and culture), it is worth noting that, prior to 1920 (see Sander's list), the following results had been obtained:—*Actaeus* (yellow) had been used to produce *San-Actaeus*, *Tom Worsley*, *Christopher*, *Sir Henry Rawlinson*, and *Moonlight*. From *Alcibiades* had come *Nirvana*, *Puffin*, *Alabaster*, *Eurybiades*, and *Perseus*. *Hera* (*Euryades*) had given *Eurybiades*, *Pyramus*, *Lucifer*, *Minotaur*, *Black Prince*. *Earl of Tankerville* had given rise to *Nesta*, *Mrs. Rickards*, *Tigris*, *Roundhead*. *Leeanum* had produced *Elatior*, *Hera*, *Lord Wolmer*, *Bruno*, *Actaeus*, etc. Others made most use of included *Aureum*, *Backmannii*, *Harrisianum*, *Lathamianum*, *Monsieur de Curte*, and *Mrs. Wm. Mostyn*.

Between 1920-30 progress was much more rapid in the development of size, form, and colour. During this period, from *Actaeus* came *Phantasy*, *Midas* and *Anita* (to-day still being used freely as a breeder of yellows). Through *Alcibiades* came *Warrior*, *Mercedes*, *Picabiades*, and *John Henry*. *Hera-Euryades* gave rise to *Bisham* and *Morcar*; *Earl of Tankerville* gave us *Joyce Hammer*, *Shamus*, *Lucullus*. To sum up: the hybrids *Alcibiades*, *Earl of Tankerville*, *Hera*, *Leeanum*, and *Nitens* were some of the chief ones used to produce new varieties, along with *Actaeus* and *Beckmannii* for yellows.

Between 1930 and 1936 twenty new crosses from *Alcibiades* were registered, and eighteen from *Actaeus*. At this point it should be noted that as better quality varieties were raised, less and less use was made of the earlier hybrids, whilst *insigne* was one of the parents of only eight new crosses registered during the same period.

But between 1920 and 1930 new hybrids with good qualities and prepotent characteristics had appeared, and by the use of these much progress was made. Some of these were *Cardinal Mercier, Carola, Christopher, Gaston Bultel, Lady Dillon, Mem. F. M. Ogilvie, Perseus, Charlotte Dillon, Chrysostum, Goliath, Golden Wren, J. M. Black, Lady Phulmoni, J. H. Walker, Mdme. A. Fevrier, Mrs. Wm. Pickup*, etc.

The following list, compiled from Sander's List, shows the number of crosses raised and registered during the stated periods.

Name and Pedigree	1931-33	1934-36	1937-40	Total
Card. Mercier (Lathamianum x ?) 1921	17	24	29	70
Chrysostum (Chris. G.D.N./Pyramus) 1922	19	28	22	69
F. M. Ogilvie (Curtmanii/Pyramus) 1919	27	20	15	62
Gold Mohur (Goliath/Lady Dillon) 1922	11	12	30	53
Gwen Hannen (F. Spencer/Christopher) 1922	14	15	18	47
Perseus (Alcibiades/Lady Dillon) 1917	12	14	21	47
Atlantis (C. Mercier/Chloris)	8	13	21	42
Christopher (Actaeus/Leeanum) 1902	9	20	12	41
Cappamagna (C. Mercier/Nubia) 1921	9	17	13	39
Mrs. Eley (Chris. G.D.N./Warrior) 1922	6	18	13	37
Warrior (Alcibiades/Lord Wolmer) 1920	9	13	12	34
Lady Dillon (Nitens/Mrs. Wm. Mostyn) ?	4	15	9	28
Actaeus (insigne/Leeanum)	7	11	10	28
Florence Spencer (Actaeus/Mem. Jerninghamae) 1917	9	8	10	27
J. M. Black (Beryl/Mirum) 1922	11	9	7	27
Alcibiades (Mons. de Curte/Leeanum) 1905	11	9	6	26
Euryostum (Eurybiades/Chrysostum) 1930	2	2	30	34
Gertrude West (Lady Phulmoni/R. Paterson) 1929	4	3	19	26
Grace Darling (Phantasy/Gwen Hannen) 1931	—	8	19	27
J. H. Walker (Lady Dillon/C. Mercier) 1927	—	9	18	27
Chardmoore (Christopher/Lena)	5	15	13	33
Hestia (Cyclops/Lady Dillon) 1919	4	10	15	29
Great Mogul ( )	4	3	15	22
insigne	7	7	3	17
Spicerianum	—	—	1	1
villosum	—	—	—	—

It is interesting to trace the development of the *Cypripedium* from the first stages of hybridising. Here are some of the most important.

The first stage was the crossing of the species.

(1) *Insigne* x *villosum* is *Nitens.*
(2) *Insigne* x *Spicerianum* is *Leeanum.*
(3) *Specianum* x *villosum* is *Lathamianum.*
(4) *Spicerianum* x *Boxallii* is *Calypso.*
(5) *Insigne* x *Boxallii* is *Monsieur de Curte.*

Second Stage.

First generation hybrids x species.

	Nitens	Leeanum	Lathamianum	M. de Curte	Calypso
insigne X	Troilus	Actaeus	G. A. Hobart	Jas. O'Brien	Melia
Spicerianum X	Aureum	Bruno	Mrs. D. Saloman	?	?
villosum X	J. Homes	Leander	Chrysotoxum	?	Thompsonii
Boxalli X	Parkerianum	Hera	Bala	?	Menelik

Third Stage.

First generation hybrids x hybrids.

	Nitens	Leeanum	Lathamianum	M. de Curte	Calypso
Nitens X	Nitens	Nitens-Leeanum	illustre	Scipio	Boadicea
Leeanum X	Nitens-Leeanum	Leeanum	Grovesianum	Alcibiades	Evelyn Ames
Lathamn X	illustre	Grovesianum	Lathamianum	?	Stevensii
M. de Curte X	Scipio	Alcabiades	?	M. de Curte	?
Calypso X	Boadicea	Evelyn Ames	Stevensii	?	Calypso

A few other more or less known and influential early crosses are as follow:—

Barbatum x *viliosum—Harrisianum Callosum* x *Leeanum—longwoodense. Charlesworthii* x *Harrisianum—bingleyense. Charlesworthii* x *bingleyense—Hassallii. Fairieanum* x *Spicerianum—Niobe. Insigne* x *venustum—Crossianum. Fairieanum* x *Callosum—Juno.*

Now refer back to the first three stages mentioned above. Some of the better-known hybrids that followed were these: *Lathamianum* x *aureum—Louvain; Leeanum* x *nitens-Leeanum—Victor*

Hugo; Leeanum x *Actaeus—Christopher; Leeanum* x *Baron Schroeder—Elatior; Leeanum* x *Hera—Lord Wolmer; nitens* x *exul—Earl of Tankerville; nitens* x *Earl of Tankerville—Roundhead; Mons. de Curte* x *Beryl—Sullivan; Mons. de Curte* x *Fairieanum—Swallowtail; Mons. de Curte* x *Thompsonii—Tommy curte.*

From this stage the hybridising naturally becomes more involved, and it is at this point that reference might be made to the pedigrees of two of the *Cypripediums* so frequently used in this work, namely, *Lady Dillon* and *Cardinal Mercier.* The parents of *Lady Dillon* are not known on either side, while *Cardinal Mercier* is considered a form of *Lathamianum;* but it is exceedingly unfortunate for breeders that the definite parentages of two flowers that have exercised so much influence on later breeding are not known. Were these known, line breeding and selection could have been followed with much more expeditious and satisfactory results. At a later stage reference will again be made to these two varieties. However, *Lady Dillon, Cardinal Mercier, Christopher, Lord Wolmer, Alcibiades, Leeanum, Hera-Euryades* soon began to dominate the field of hybridisation from this stage.

Summary of prominent parents used in production of *Cypripedium* hybrids.—The following table, composed from Sander's List of Hybrids, gives a fairly clear indication of the manner in which the various parents have been used. A brief study will show how some were very freely used for a period and then dropped—in most cases, no doubt, due to the use of new and improved forms. In a few cases, e.g., *Actaeus, Alcibiades,* and *Cardinal Mercier,* some parents have been consistently used since their appearance. In other cases, e.g., *Hestia, Gold Mohur,* and *Great Mogul,* recognition of their value as parents was slow, or opportunity to use them was limited.

PARENT— SPECIES	Up to 1920	1921-30	1931-33	1934-36	1937-40
barbatum	48	1	—	—	—
bellatulum	49	3	2	—	3
Boxallii	41	1	—	—	—
callosum	49	2	1	—	1
Charlesworthii	50	9	2	2	1
Curtisii	38	4	—	—	—
Druryi	29	3	—	—	1
Fairieanum	58	11	5	2	8
Godefroyae	28	3	—	—	—
hirutissimum	29	2	1	1	—
insigne	116	13	7	1	3
Lawrenceanum	53	4	2	1	2
niveum	40	8	2	1	—
PRIMARY HYBRIDS					
Nitens	62	2	—	—	—
Leeanum	90	24	2	7	3
Lathamianum	35	2	—	1	1
Monsieur de Curte	21	—	—	—	—
Calypso	24	4	—	—	—
PRIMARY HYBRIDS X SPECIES					
aureum	33	21	—	—	—
Actaeus	18	35	7	11	10
Troilus	19	15	4	1	2
Bruno	1	1	—	—	5
Hera (Euryades)	57	22	6	2	1
PRIMARY HYBRIDS X PRIMARY HYBRIDS					
Nitens-Leeanum	12	29	7	5	—
Alcibiades	29	52	11	9	6
EARLY HYBRID CROSSES (Before 1920)					
Desdemona	1	14	4	4	4
Dreadnought	11	12	3	—	—
Earl of Tankerville	20	33	1	2	1
Gaston Bultel	9	26	5	3	3
Germaine Opoix	9	8	3	3	4
Harrisianum	62	4	1	3	1
Lady Dillon	3	28	4	15	9
Lord Wolmer	5	31	6	1	5
Lucifer	3	6	4	2	4
Maudiae	11	5	—	4	7
Mrs. W. Mostyn	23	8	—	—	—
Niobe	20	3	—	2	—
Psyche	7	7	1	1	—
Pyramus	3	22	6	8	—
San-Actaeus	7	4	—	2	1

Shogun	2	17	5	5	—
Thompsonii	15	17	—	—	—
Troilus	19	15	4	1	2
CROSSES RAISED BETWEEN 1920-30					
Cardinal Mercier		14	17	24	29
Carola		19	8	7	1
Charlotte Dillon		5	5	10	5
Christopher		44	9	20	12
Chrysostum		17	19	28	22
Dixon Thorpe		3	3	4	5
Doris Stanton		3	1	8	2
Elise II		7	4	7	8
Eurybiades		23	6	3	12
Florence Spencer		6	9	8	10
Golden Wren		4	4	1	2
Gold Mohur		1	12	12	30
Great Mogul		1	4	3	15
Gwen Hannen		8	14	15	18
Hestia		4	4	10	15
J. M. Black		9	11	9	7
Lady Phulmoni		3	5	5	10
Mdme. A. Fevrier		7	3	1	2
Major Hanbury Carlyle		3	8	10	5
Marne		3	1	3	4
Mem. F. M. Ogilvie		13	27	20	15
Mem. H. J. Elwes		1	4	6	6
Mem. J. H. Walker		2	—	9	18
Robert Paterson		2	12	1	12
Roundhead		2	2	5	5
Selene		9	—	2	2
Senator		3	—	4	—
Swallow		15	4	9	5
Viking		2	3	3	2
Warrior		4	9	13	12
Mrs. Wm. Pickup		6	2	2	—
Mulatto		12	9	2	—
Nirvana		7	10	5	—
Odin		11	3	4	—
Our Prince		4	3	8	—
Perseus		18	12	14	21
Prince Albert		4	4	6	—
CROSSES RAISED SINCE 1930					
Anita			5	4	5
Atlantis			8	13	21
Ballyhandy				2	8
Bordube			2	5	4
Bromilowianum			1	5	3
Cappamagna			9	17	13
Carcroft					1
Chardmoore			5	15	13
Conference			5	7	5
Delenati			1	3	6
Doris Black				2	4
Euryostum				2	30
Everest					5
Gertrude West			4	3	19
Grace Darling				8	19
Grey Friar				4	1
John Henry				5	8
Londonum			1	3	5
Lord St. Vincent					8
Luna				1	9
Maimoa					4
Maori				2	7
Megantic				2	3
Memphis					4
Minotaur			4	4	4
Miss Amy Johnson					2
Moonlight				2	5
Morea				5	8
Mowgli			1	4	?

Mrs. Carl Holmes		8	?
Mrs. Eley	6	18	13
Noel Hardy	4	2	?
Renown	2	2	6
Sebastian Cabot	1	4	5
Symphony	1	1	1
The President		2	5
Thias (Forest King)		3	3
Thrums		1	6
Trismegristis			2
Walter Moore		2	3
W. H. Page	1	1	5
Windrush	1	11	5
Worsleyi	7	7	8
Ysolde			1

Now, it is well known that all the progeny of any one cross, whether between animals or birds, trees or flowers, do not carry prepotent characteristics; and again, of those that do, some have and pass on characteristics not desired by the breeder. Hence we see much variation in our Orchids, even when the seed all comes from the one seed pod. Thus, of all the seedlings raised by crossing *Doris Black* and *Grace Darling*, there has been only one *Diana Broughton* var. *Alcestis*, though many others are very good. Whether or not this variety, in turn, is proving a successful breeder I am not aware, as war conditions have affected publications, registrations, descriptions, etc.

A rough analysis of awards gained by hybrids raised from some of the well-known varieties is as follows:—

	Awards (F.C.C. and A.M.) from 1934 to 1939						
Parent	1934	1935	1936	1937	1838	1939	Total
Cardinal Mercier	2	2	8	7	3	4	26
Gwen Hannen	3	3	2	4	4	3	19
Warrior	1	2	1	2	2	3	11
Chrysostum	3	4	4	9	10	5	35
Mem. F. M. Ogilvie	9	9	12	10	3	6	49
Gertrude West		1	1	—	4	3	9
Gold Mohur			1	3	—	1	5
Grace Darling				3	2	5	10
Mem. F. M. Worsleyii	1	1	2	1	2	2	9
Hestia			5	2	2	3	12
Lady Dillon	2	3	5	4	5	3	22
Christopher		2	3	2	1	3	11
Atlantis				2	1	5	8
Maori	1	1			3	3	6
Minotaur	1	1	7	1	3	3	16
Elise	1	1	5	1	3	—	11
Perseus	1	1	3	—	1	4	10
Lord Wolmer	5	4	1	—	—	—	10

In 1940 we find the following being used freely to produce new varieties: *Mem. J. H. Walker, Christopher G.D.N., Chrysostum, Perseus, Gold Mohur, Eurybiades, Hestia, Euryostum, Chardmoore, Ballyhandy, Cappamagna, Ernest Hannington, Warrior Green's* var., *Anita, Grace Darling, Swallow, Diana Broughton, Carcroft, Maori, Erin,* etc.

It should be noted that of late years the standard required to gain an award has been raised considerably, and most outstanding quality, form, and colour are required to-day before an award is made.

Incidentally, those who have perused carefully some of the latest English Orchid catalogues will probably have noted that, now and again, a modern hybrid has been mated back to one of the earlier ones. Some results have been excellent, probably due to the good influences of line-breeding.

PART III.

The previous articles have indicated that the modern *Cypripedium* is the result of following-up, or making much use of, line-breeding. It may be noted that a few breeders have mated some of the latest with some of the earlier hybrids with satisfactory results—usually for the purpose of intensifying a certain characteristic. However, practically no use is being made of species in that respect, except as will be indicated later.

It was pointed out that among parents most freely used were to be found the following: *Cardinal Mercier, Chrysostum, Mem. F. M. Ogilvie, Hestia, F.M. Worsleyi, Carola, Lady*

Dillon, Pyramus, Warrior, Gold Mohur, Gertrude West, Gwen Hannen, Florence Spencer, and *Grace Darling.* It will no doubt be interesting later on to hear news of the progeny of *Diana Broughton, John Keeling, Kay Kay Sunny, Ambition, Aylesbury, Montmartre, Brigadier, Mrs. Glover,* etc.

In reply to some questions submitted to an eminent English breeder of long standing, the following information was obtained:

1.—*Christopher* (especially var. *Grand Duke Nicholas*) has been much used. This was the largest type in its hey-day, and is behind all the large types, such as *Chrysostum* var. *Richard Fort, Gwen Hannen, Florence Spencer, A. K. Berry,* etc. *Christopher-Acteus* x *Leeanum, Actaeus—Leeanum* x *insigne; Leeanum—Spicerianum* x *insigne.*

2.—*Cardinal Mercier* (*Lathamianum* x unknown hybrid) is the parent of most of the coloured varieties, such as *Mem. J. H. Walker, Cappamagna, Eastlea,* etc.

3.—The best yellows also come from *Christopher,* e.g., *Grace Darling, Diana Broughton, Ansun;* but it is to be noted that *insigne Sanderae* blood is behind the parents of *Christopher.*

4.—*Mem. F. M. Ogilvie* is a very good seed-bearing parent, and has produced some fine varieties, with good broad petals and white dorsals well spotted. One cannot tell which parent a seedling will take after. Experience, however, has shown that a large percentage of seedlings out of the same seed-pod will take after the seed-bearing parent. This applies to *Cypripediums.* Along the same lines it has been established that there are certain lines of dairy cows which have a greater ultimate influence on the milking qualities of the progeny than that of the sires. These facts have only been established after long years of line-breeding.

Summed up, this means that if *Cardinal Mercier* (or a closely line-bred descendant) is used as a seed-bearing parent, one expects colour; from *Christopher* one expects large, bold flowers; and from *Mem. F. M. Ogilvie* nice, clean, well-spotted dorsals, and good wide petals. Species are not now being used, lacking, as they do, both form and colour. Finally, this breeder sums up thus: We have size in *Cypripediums*—a flower with a dorsal three to four inches across is quite large enough; therefore breeders are striving to achieve colour and character.

From this it will be seen that, rather than cross varieties indiscriminately, a would-be breeder would be wise to work out the pedigrees and then cross only those varieties that will be the most likely to produce the desired results, at the same time studying carefully which one should be used as the seed-bearing parent. There will be disappointments, but the stage has now been reached where, if good types of sound blood-lines are crossed, one can look forward to a satisfactory percentage of good forms, few real "duds," and perhaps a champion.

So that readers may the more readily follow up the above, hereunder are listed some of the best of the progeny of the above-mentioned varieties.

Cardinal Mercier (84 crosses listed) is the parent of: *Mocha, Atlantis, Amasis, Memphis, Mem. J. H. Walker, Cappamagna, Cardinal, Armentieres, Mecca, Magnolia, Eventide, Joan Glenn, Hunsworth, Lady Rose, Easter Hero, Mandalay, Florence Smart, Coriolanus, Melu Crimson King, Magdala, Angel Luscombe, Selma, Eastlea, Red Gauntlet, Loudwater, Carbury, Morontes, Westholme, Susan Mercier, Thames, Noblesse, Ogon.*

From *Christopher* (85 crosses listed): *Finetta, Mrs. Eley, Sebastian Cabot, Gwen Hannen, Edzell, Alderman, A. K. Berry, Chrysostum, Windrush, Hon. Elwes, Bromilowianum, Buddha, Chloristopher, Ardaco, Nicholanita, Avis, Armstrong Moldavia, Estrella, Chrisan, Caracus, Chrislon, Modasa, Clovis, Colcar.*

From *Mem. F. M. Ogilvie* (95 crosses listed): *Morea, Robert Paterson, Lord St. Vincent, Amazon, Easter Hero, St. Lawrence, Humber, Mrs. O. W. Walker, Lothario, Skindles, Severn, Miss Amy Johnson, Rishworth, Jerry Cowburn, Staincliffe, Catton, Bledlow, Dillhurst, Trismegristis, Monsoon, Hextol, Montezuma, Alston, Snake, Harle, Simonburn, Tipalt.*

The blood-lines of *Cardinal Mercier* are not known. *Christopher* has three of *insigne* and two of *Spicerianum. Mem. F. M. Ogilvie* has three of *insigne,* four of *Boxallii,* three of *Spicerianum,* and one of *bellatulum.*

Breeders seeking colour would probably get best results by breeding from those listed from *Cardinal Mercier;* if after size, breed from the *Christopher* list; while best forms will probably be assured by breeding from the *Mem. F. M. Ogilvie* list. If after size and colour, cross between the *C. Mercier* and *Christopher* groups, and so on.

PART IV.

In my first article I mentioned but six species, but little or no reference has been made to the influence of *callosum* and *barbatum* in the production of the modern *Cypripedium.* Speaking broadly, their influence has not been great, nor have the following been used in breeding to any great extent: *bellatulum, Fairieanum, hirsutissimum, venustum,* and *Charlesworthii.* However, a few more trials have been made lately with *Fairieanum.* The modern *Ambitien* comes from *Gwen Hannen* var. *Field Marshal* x *Fairieanum,* and has the reputation of being a flower of quality and beauty. Years ago, *Niobe* was raised by crossing *Fairieanum* and *Spicerianum.* From *Niobe* came *Baldur, Bendigo, Corsair, Latona, Lucifer,* and *Nydia. Lucifer Westonbirt* var. is *Niobe* x *Hera,* and, I think, gained a First Class Certificate. Then *Lucifer* x *Julian* gave *Crusader Westonbirt* var. *F.C.C.,* and crossed with *Earl of Tankerville* gave *Marmian.* Another line comes through *Swallow* (*Satyr* x *Swallowtail*). *Swallow* x *Jura* produced *Macaw magnificum, Swallow* x *Garibaldi* gave *Gerda A.M.,* and *Mulatto* x *Swallow* produced *Juliet magnificum.*

In 1941, *Endromis* (*Cardinal Mercier* x *Fairieanum*) was flowered by Mr. Puddle in England, and is described as a beautiful flower with heavy rich rose-purple on a white ground, with green petals lined reddish-brown.

The well-known hybrid, *Harrisianum,* has apparently not proved very satisfactory as a breeder, yet what a beautiful flower *Ball's* variety is! Sander's List contains only one *Harrisianum* cross in the 1937-1940 addendum.

Then there is the relatively new species, *Delenati,* with its round rose-pink pouch and white petals and dorsal—the flower niveum-like in shape and habit. Already some hybrids have appeared in England from this—the pale rose-pink *Madame Martinet* (*callosum Sanderae* x *Delenati*), and *Madelen* (*Delenati* x *Cardinal Mercier*).

Mention of *niveum* recalls the fine work done by Mr. F. C. Puddle in England with this type. Apparently they are somewhat more difficult to grow—especially in some parts; but perhaps some Australian growers can more readily produce the right conditions to grow the white-dorsal type successfully. Have any succeeded?

In 1909 *Cyp. Boltonii* (*niveum* x *insigne Sanderae*) showed that this line would produce whites. Other whites produced were *Ivorine* (*bellatulum* x *Leeanum*), *Peace* (*Lathamianum* x *Psyche*), *Armistice* (*niveum* x *Sanacderae*), *Snowdrift* (*niveum* x *actaeus*), *Astarte* (*Psyche* x *insigne Sanderae*). *Astarte* proved an excellent parent, producing *Albion F.C.C.* when crossed with *niveum, F. C. Puddle* F.C.C. var. when mated with *Actaeus,* and *Rosy Dawn* A.M. when crossed with *Gwen Hannen alba.* Note that *insigne Sanderae* played an important part on both sides. In articles appearing in the English Orchid Review in 1936 and 1941, the writer points out that *niveum* and *bellatulum* on the one side, and *insigne Sanderae* and *Spicerianum* on the other give better whites than *niveum* x *insigne Sanderae.* The last has a colour suppressing influence, but not always. Other good ones were *Chastity* (*Nell Gwynne* x *Astarte*), *Cyrestia* (*Golden Fleece* x *Psyche*), and *Nixvius* (*Florence Spencer* x *Psyche*). Mr. Puddle points out that increased size is wanted, but warns raisers against straying far from the *niveum* group lest white gives way to yellow. Hence he suggests it best to breed between the hybrids themselves. By 1941 Mr. Puddle had flowered *Winsome* (*Mrs. Carl Holmes* x *F. C. Puddle*), *Butterfly* (*Florence Spencer* x *F. C. Puddle*), and *Hylophila* (*Florence Spencer* x *Nell Gwynne*). All had white dorsals and petals, tinged with faint honey-yellow and/or green.

A few words on albinism, mostly gathered from copies of the English Orchid Review. Albinos have appeared mainly from the albino forms of *Lawrenceanum, callosum* and *Curtisii. Lawrenceanum Hyeanum* x *callosum Sanderae*—*Maudiae* (1900). *Maudiae* x *Curtisii Sanderae* gave us *Emerald. Insigne Sanderianum* x *Maudiae* produced *Rosetti. Doris Black* var. *Venus* (*Golden Wren* x *Florence Spencer*) is an albino. Two albino forms of *Grace Darling* have appeared in the varieties *Stonehurst* and *Princess.* It is noteworthy that *Diana Broughton* var. *Alcestis* was bred from the two albino forms of *Doris Black* and *Grace Darling.* There are four species in the make-up of *Grace Darling*—*Spicerianum, Druryi, villosum, insigne,* and *Boxalli*—and not one an albino.

I would refer readers to a most interesting article in the form of a letter by Mrs. Helen Adams, of U.S.A., which appeared in the English Orchid Review in 1941. Mrs. Adams refers most interestingly to the presence of "red" in *Cypripediums,* and to "red" breeders. After indicating that *Mem. J. H. Walker*—*Cardinal Mercier* x *Lady Dillon,* that *Lady Dillon*—*Nitens Ball's* var. x *Mrs. Wm. Mostyn,* and that *Cardinal Mercier* is a form of *Lathamianum* (*Spicerianum* x *villosum*), she points out (see previous article) that *Cardinal Mercier* is a red breeder—quite an argument for its being a recessive. One *Lady Dillon* (Mr. Cookson's), she maintains, must be also, because he has made all his red crosses except one with *Cappamagna* and *Cardinal Mercier*—xx i.e. *C. Mercier* x *Cappamagna* gives red. From this she develops the argument that if early crosses were now raised in large quantities (not possible years ago) by modern methods, and primary and secondary crosses carefully selected, the present standard

Notes from Southport, Queensland

J. McG. WILLS, *Southport, Q.*

● Some of my *Cattleyas* are making two growths from the forward bulbs, and vigorous healthy roots are travelling through the compost, so I anticipate that all is well with them.

Under my conditions I find that a very open compost is necessary, anything suggesting tight potting is disastrous, the roots dying back from the tips and soon rotting altogether.

In potting, three-quarters of the pot is filled with coarse charcoal, then a little fibre, which is topped off with a moss that I gather from trees on the mountains. It grows mostly on wattle trees, and is usually growing wherever *Sarcochilus falcatus* is found. I do not know the name of the moss. It seems superior to sphagnum moss under my conditions, because it will not rot, or break down during the winter. All types of Orchids seem to do well in it with me provided the plants are potted high, then the eyes, even on back bulbs, seem to take a fresh interest in life, and commence to grow.

When wooden baskets are used I put a layer of fibre on the bottom, and then just fill in around the roots with the moss, and it is surprising how quickly the roots put on fresh growth. The fact that *S. falcatus* always grows in association with this type of moss up here first attracted my attention, and a change-over to its use in potting has been well worth while.

Recently I took a trip to Springbrook, Qld., for a fresh supply, and had a most enjoyable day. On the way up the mountain the road on each side for half the way was lined with *Hovea* in full bloom, and the light mauve flowers made a picture like a miniature Grafton (N.S.W.) when the Jacarandas are in bloom. *Hardenbergias* and hosts of other shrubs were also in bloom, and the air was filled with their scent.

We—my friend and I—spent the morning up on the side of the mountain about 3,000 feet above sea level, collecting the moss that we needed, and also acquiring some specimens of *S. falcatus*, most of which were just coming into flower, and since this was the first occasion that my friend had been able to observe this lovely little plant growing under natural conditions, you can imagine what an interesting experience it was to him to see *S. falcatus* growing from trees everywhere we went.

After lunch, we went in search of the now very rare *Sarcochilus Hartmannii*, and, after searching over about five acres of rocky country, he found a splendid specimen, measuring about eighteen inches by ten inches, with numerous flowers spikes, the buds on which were just beginning to fill out. My friend now has it growing splendidly in his bush-house, and it is an absolute delight to see, with its numerous creamy-white flowers with the vivid red centre.

Dendrobium Kingianum and *D. speciosum* were growing there in abundance, all just flowering to perfection, and the thing that struck me most forcibly was the depth of colour in the *D. Kingianum* blooms. They were deep reddish purple, whilst those growing at lower altitudes throughout the south coast of Queensland are always a light pink; no doubt it is something to do with the different atmosphere.—14/10/1944.

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of results could be obtained much more quickly.

At least we can realise this, that to-day the large-scale breeders of *Cypripediums* are following line-breeding methods, plus selection, but are not neglecting out-crosses of a suitable nature. Finally, I would suggest that those with greater experience and deeper knowledge of *Cypripediums*, their development, breeding and cultivation, would write to give other Orchid lovers the benefit of their experience and understanding. I must candidly admit that my personal knowledge and experience are very limited.

● "Four of us staged a modest little show here early in October. We had a display of Orchids in bloom, and cut flowers and potted plants for sale. The result was the sum of £22 for the local Red Cross Branch. Plants exhibited included six pots of *Dendrobium nobile, D. infundibulum, D. Findleyanum, D. fusiforme, D. primulinum, D. falcorostrum, D. Kingianum, Cymbidium eburneum, C.* x *Loweo-eburneum, Vanda coerulescens, Coelogyne flaccida, Sarcochilus Hartmannii, Phaius (grandifolius) Tankervilliae, Epidendrum* x *Boundii*, and *E.* x *O'Brienianum*."—Miss K. M. McIlrath, Murwillumbah, N.S.W., 23/11/1944.

● Membership subscriptions to the Orchid Society of New South Wales for 1944-45 are now due, and payable to the Hon. Treasurer, Mr. J. Bisset, 48 Wareemba St., Abbotsford, N.S.W. **Members in arrears are requested to post their remittances by return mail.**

On Leave in Brisbane, Nov., 1944

Gunner L. A. PEATY, *Sydney, N.S.W.*

● Most of the growers in Brisbane use unheated glasshouses, and achieve remarkable success with *Cattleyas, Vandas* and *Phalaenopses,* and to a lesser extent with Dendrobes. *Cymbidiums* and *Cypripediums* are not so good, as the winter is too warm, and they will not stop growing. Mr. Gordon Smith had a lot of terete *Vandas* growing out in the open garden. I saw *teres,* x *Rosalia,* x *Emma Nagrok,* and x *Miss Dinger* in bloom, and there is no doubt they are very lovely and desirable subjects. I think they should not be out of place under our conditions. His lemon tree was covered with Dendrobes, and it was an object lesson on how they can grow on a suitable host; roots were everywhere and growth superb. I am going to try it some time.

Frangipanni is also a suitable host up here. From Mr. Smith I received a gift of a small plant of *Dendrobium superbiens* to experiment with. He also had a very fine *Epidendrum radicans,* with flowers at least twice as large as those of *E.* x *Boundii,* and I also obtained a piece of that. Mr. Smith joined us, and we proceeded to Mr. Hilsden's home, about three streets away.

Here again I saw *Vanda* x *Rosalia* and several other terete types in flower. In his first glasshouse he has mostly *Vandas,* such as *tricolor, suavis,* etc., all in bloom. Mr. Hilsden also had a very pretty blue hybrid with two or three spikes. There was a coloured plate of this same *Vanda* in one of the early *Australian Orchid Reviews.* It is a cross between *tricolor* and *coerulea,* I think. He also had several *Phaius,* but their blooms were just about done.

In the second house were quite a lot of *Cypripediums,* doing moderately well — several had buds. There was quite an assortment of flowers in this house, including some nice *Cattleyas,* L.C's and B.L.C's, etc., one of which was quite a nice orange colour, *Phalaenopsis Schilleriana,* and a couple of other *Phalaenopses.* Mr. Hilsden also had some very beautiful Dendrobes, including a yellow *undulatum* and some three or four *Schroderianum* hybrids, and several good *superbiens.* One unique thing he had was a plant of the Jewel Orchid (*Anoectochilus*), which was described in an early *Australian Orchid Review.* It was growing under a glass dome, and was of brilliant jewel-like purplish hues in the leaves. Here again I was impressed by the ease with which they grow *Cattleyas* and *Vandas* and the northern Dendrobes and their hybrids.

I have seen numerous plants of *Dendrobium nobile, D. aemulum, D. Pierardii, D. chrysotoxum, D. Hildebrandtii,* etc., either in bloom, just finishing, or in bud.

Bidding Mr. and Mrs. Hilsden and Mr. Gordon Smith a reluctant farewell, we went on our way to Mr. Beard's home. We duly arrived at Mr. E. J. Beard's home, which is situated on the highest part of Paddington, with a view looking over the whole of Brisbane and its suburbs, a much nicer aspect than our Paddington. His front verandah, two storeys up, looks down on his terraced front garden, which is a lovely sight. There was a huge shrub of *Browallia* growing directly underneath the verandah, and it was a mass of orange and yellow. Also in the garden there were plants of *Vanda teres* and *V.* x *Rosalia* in bloom, and some huge red and variegated *Hippeastrum* lilies, which he had raised from seed. Mr. Beard very kindly gave me half a dozen bulblets of a huge blood-red one, which was his special pride, and which, indeed, was a beauty.

In bloom were a few nice *Cattleyas,* two *Cypripediums,* white ones, I think the name was *niveum, Dendrobiums,* including *superbiens, thyrsiflorum,* in bud, and several other Indian types.

One novel and interesting exhibit was several plants of *Vanilla,* an Orchid from which vanilla essence comes. It grows luxuriantly, creeping everywhere like a lawyer vine.

Mr. Beard showed me four or five volumes of a publication called "Reichenbachia," compiled by Sanders, each volume being about 1½ inches thick, and the pages almost as big as an average newspaper sheet. It contained full descriptions of Orchids, accompanied by exquisite colour prints of paintings of various plants in bloom. It would take hours to even glance through the volumes, and one day I hope to have an opportunity of a decent "browse" through them.

After a very nice cup of afternoon tea and a good look through the three glasshouses, we reluctantly left on our way home to Kelvin Grove, where we had tea with Mr. and Mrs. Lewis, and, incidentally, had a quick glance through their house, which is really an extension of the back of the house. It, however, has glass sides and a slat roof. I was also out at their place the following Saturday afternoon, and so will give a brief description. Mr. Lewis's

Cattleyas are all growing really well, and are very clean. A hint I got was that methylated spirit is an excellent insecticide, and cleans up scale and thrips "like smoke." Use a small paint brush or a tooth brush to apply it. Others up here use it too, and it doesn't hurt the plants. He had two plants of *Vanda tricolor* and one *V.* x *Rosalia* covered in bloom, and *Dendrobium atroviolaceum* in bud. Also I noticed *Den. cariniferum* in bud; I thought it was *D. infundibulum*, as it had the same hairy bulbs, and the same habit of flowering. It is a similar type, only it has creamy flowers instead of the pure white of *infundibulum* and *Jamesianum*. Mr. and Mrs. Lewis have been very kind to me, as I have been to see them three times now, and each time I have been made welcome.

Now on to the Sunday trip, which was as the guest of Mr. and Mrs. Harold Campbell, of Clayfield. They gave me a most enjoyable day, and during the morning we visited a couple of collections. Towards evening they drove me around Ascot, Doomben, and Hamilton, showing me some of the loveliest of Brisbane's old and new homes. Also, from the top of a hill called Barton's Folly, I had a view of Brisbane and the river, as fine as one could wish for. It was from the eastern aspect, whereas Mr. Beard's home gave the view from the western aspect.

Mr. Campbell's houses are three in number. No. 1 is glass, with adjustable louvre vents close to the ground. It is quite a hot house, and was built for "Cooktowns" (*Dendrobium Phalaenopsis*). No. 2 house has glass sides with a slat roof, and here an experiment with green glass seemed to me to give quite a good effect and subdued light. It was full of well-growing *Cattleyas*, many of quite a large size. Mr. Campbell also has some nice large plants of *Laelia anceps*, which made me very envious, and some 20 or so *Cymbidiums*, all growing well, including a sundry collection of foliage plants, ferns, a few *Phaius*, Dendrobes, and *Vandas*.

No. 3 is a very well built glasshouse, about 20 feet by 16 feet, an ideal size, to my way of thinking, for an average amateur collection. It, of course, was full of *Cattleyas*, *Vandas*, and *Phalaenopses*, with a few *Oncidiums*, *Cypripediums* and *Calanthe* for good measure. All were growing very well, and of blooms I saw a couple of fine *Cattleyas*, and quite a number of *Phalaenopses*, which, incidentally, are very nice Orchids when in bloom.

During the morning we visited both homes of Mr. Parton and Mr. Smolenski, and I will just say that both were growing the usual types I have mentioned before. They favour using blood and bone direct onto the compost, and seem to be able to get good growth without damaging the roots. I would sooner use it in a liquid form, so that when the plant is resting it would not have fertiliser still in the compost.

As far as composts are concerned, Brisbane growers are not as faddy as we Sydney growers are. Fibre is mostly the basic component as far as I could gather, and they use staghorn peat and sphagnum moss at times, too.

Some further notes from Jamberoo. I wish to make a small correction in my "Notes" published in the *Australian Orchid Review*, September, 1944, issue.

In quoting my experiences with back bulbs of *Cymbidiums*, I inadvertently mentioned a back bulb of *Louis Sander*. This should have been *Midas*, from which I had had three growths and had replanted. Doubtless my previous remarks regarding *Louis Sander* must have led me astray. This *Midas* back bulb, from which I had three growths, I replanted on 19th September, 1944, and now, at the present time of writing, it has thrown yet another strong growth, making the fourth from the same bulb.

Lest this should be thought peculiar to *Midas*, I also have the following *Cymbidiums* which have given me extra growths from the same bulb: *Zenobia*, two strikes; *Louis Sander*, two; and another *Louis Sander*, three; but this last growth seems rather on the weak side; *Veronique*, two; and *Cascade*, three.

It seems to me that, so long as the bulb remains firm and healthy, extra strikes are possible. Have other growers similar experiences? I find that you can expect a strike from bulbs planted in spring from four to six weeks, and at other times of the year correspondingly longer. For instance, bulbs planted in June are showing growth in December. In January, about May, and so on. I have also had several instances of bulbs throwing growths well up the bulb at the side. In fact, at the present time I have a *Ceres* which has a nice growth exactly in the centre of the bulb. This, I think, suggests fairly deep planting is necessary.

—H. R. COLLEY, 3/1/1945.

● "I mention a *Cymbidium grandiflorum* regularly flowered by Mrs. Fraser, potted in woodheap chips in a hollow stump about thirty inches high, and grown under the sparse shade of a rose bush. It has just flowered again this year, producing three lovely racemes, with over twenty flowers on each raceme."—Miss K. M. McIlrath, Murwillumbah, N.S.W., 23/11/1944.

The Orchids of North Queensland

J. MURRAY COX, *Townsville, Qld.*

● In the happy days of peace the scrubs and forests of North Queensland provided a happy hunting ground for the Orchid collector, but in these times of war, with their stresses and strains, few have the time, and none has the means at his disposal, to pursue an Orchid hunt. During the last 18 months, the greater part of my time has been spent in North Queensland in a series of hectic visits, and on none of these occasions have I found time even to visit the collections of Orchid cultivators, or to spend an hour in the quest of plants, although I have on many occasions passed through the known habitats of some of our grandest species.

But although the war has robbed many of us of much of our time usually devoted to the growing of Orchids, I am of the opinion that, as is so often the case, out of the evil of war will come good. The virile fertile tropical jungles and forests of Cape York Peninsula have never been efficiently and completely prospected for the discovery of new Orchids. For one reason, transport has been exceptionally difficult, and the greater part of the Peninsula has been possible of traverse only by means of pack-horse, and even then only in certain of the more sparsely timbered areas. The exigencies of war, however, have made necessary the construction of roads through the densest jungles, and although the hungry jungle will creep over these tracks again, it will always be possible to find a pathway through them. These Peninsula jungles hold much hope of the discovery of hitherto unknown Orchid treasures, and if in the grand new world finance is available for the quest of such unmercenary things as Orchids, I venture my reputation as a prophet to forecast that many new species of the order will be found.

New Guinea is rich in Orchids, and as scientists of various kinds have drawn analogies between the flora and fauna of the two places, and from the evidence available, have argued that Australia and New Guinea were once joined together, it is more than probable that an intensive search of the Peninsula jungles will disclose species closely akin to those of the Papuan jungles.

One genus which I have always felt would be found in North Queensland is the *Cypripedium*. Papua is rich in "Slipper Orchids," and I feel certain that somewhere in Cape York Peninsula there will be found some native species. We have one member of the tribe already reported, *Apostasia stylidoides* (Reichenbach), a humble, grasslike plant found in the Rockingham Bay area.

But whatever the future may hold for us, we have some known Orchids in North Queensland which can hold their own in any collection. Indeed, I would say that a person could form quite a satisfactory collection of plants of horticultural value consisting of North Queensland Orchids alone.

In this paper I propose dealing only with those Orchids which lend themselves to culture from a horticultural viewpoint, and will not touch upon the vast collection of species of more purely botanical interest — although many of these are very beautiful in their small way.

The outstanding genus in North Queensland is the *Dendrobium*, and some of the species are as fine as any of the *Dendrobium* found in any part of the world. One of the best known is *Dendrobium bigibbum* (Lindley), which is found right through the Peninsula and in the islands of Torres Strait. It has stems about a foot long (rarely more than 15 inches), with a few lanceolate leaves at the top. Racemes bearing a number of symmetrical flowers grow from the upper nodes of the matured stems—the same stem often producing flowers for two or three years in succession. The blooms have a wide range of colour, from a pure white to a very deep lilac-purple. Typical of the flower is the white or yellow crest on the disk of the labellum. Closely akin to *D. bigibbum* is *D. Phalaenopsis* (sometimes regarded as a veriety of *D. bigibbum*). In this species the stems are longer and often stouter, and the flowers are generally somewhat larger than those of the first-mentioned species. They range in shade from white to so deep a purple as to seem almost black in certain lights. These flowers last well, and are a useful Orchid for table decoration or for wear. Its range is from north of Cairns right through the Peninsula. *Dendrobium superbiens* is another fine *Dendrobium* usually regarded as a natural hybrid between *D. Phalaenopsis* and *D. undulatum*. This beautiful Orchid has much the same range of colour as *D. Phalaenopsis* (though I have not seen or heard of a white variety of *superbiens*). Its sepals and petals are narrower than those of *D. Phalaenopsis*, and are somewhat undulated and retroverted. The labellum is rather short and pointed. *Dendrobium Goldiei* is somewhat similar to *superbiens*, and the colour is a richer shade of purplish-red, while the lip is broader, and rounded at the tip. Both *superbiens* and *Goldiei* are found in the coastal scrubs from Cooktown north, and through the islands of the Straits.

Dendrobium undulatum is found along the coast right from Lady Elliott Island in the south up to Cape York. It is a very variable Orchid, and ranges from a dark brown through a rich gold to a bright yellow, according to the variety. It is particularly notable for its twisted and contorted segments. The flowers are of good size, and are borne prolifically on long racemes. It is a hardy Orchid, and grows well in a warm, sunny position. The bright yellow variety (*Dendrobium undulatum* var. *Broomfieldii*) is particularly attractive. Closely akin to *D. undulatum* is *D. Johannis*, with its smaller flowers with dark-brown sepals and petals and yellow tip, and *D. fuscum*, a rather drab-coloured Orchid, found on Magnetic Island. *D. Johannis* is found from north of Cooktown to Cape York. Perhaps the grandest of the North Queensland *Dendrobiums* is *D. Tofftii*. This splendid Orchid is found in the far-northern coastal scrubs, chiefly in the Daintree River country. It has tall, stout, pseudo-bulbs, dark brown in colour, and prominently ribbed. Flowers are large, and are of the "Antelope" type of Orchid. The sepals and petals are white, and the labellum a deep, rich purple, the side lobes and the throat being striated. Unfortunately, as well as being difficult to obtain, it is even more difficult to cultivate, and rarely flowers in "captivity." *Dendrobium canaliculatum* is plentiful from about Mackay to Cooktown. Known as the "onion" Orchid, this rather attractive plant grows chiefly upon tea-trees. The sweetly scented flowers are white, yellow and dark purplish brown. *Dendrobium speciosum* grows throughout the coastal scrubs, and all the varieties are found. *D. fusiforme*, with its spindle-shaped stems, is also quite common in the rain-forest country, and when in bloom its silvery-white sprays of flowers are a handsome sight.

D. Smilliae grows plentifully throughout the far north from about Ingham onwards. The plant has stout furrowed stems up to about 26 inches high, crowned with half a dozen oblong lanceolate leaves up to six inches long, and about half that in width at the widest part. They spring from the upper nodes of the newly matured stem, and carry a cluster of numerous small flowers, varying from pink to crimson in colour, tipped with green, and with a spur longer than the sepals. A variety of *ophioglossom* has been reported from Gordonvale, near Cairns. This plant has yellow flowers. *D. Smilliae* is known as the "bottlebrush" Orchid, from the shape of the flower spikes. These are only a few of the *Denrobiums* of North Queensland. The plants mentioned are the most important of the genus from a horticultural point of view, but many of the others are worth while growing, although space does not permit of their inclusion in this paper.

Cymbidiums, though the number of species is not great, grow plentifully throughout North Queensland, the species most frequently met with being *C. canaliculatum*, of which four varieties have been noted, including the attractive variety, *Sparkesii*, which is found on the Atherton Tablelands and on the ironbark trees of the ranges. It is a really attractive plant, and grows quite well under cultivation. *C. Hillii* and *C. iridifolium* are plentiful, and although their individual blossoms are small, each has its own charm.

An outstanding Orchid is a variety of *Phalaenopsis amabilis*, recorded as *var. Rosenstromii.* This lovely plant has been reported from Mount Spec, Bambaroo, and other places near Ingham, and also from Mt. Bartle Frere and the Mossman River, further north. The flowers are closely similar to the type species *P. amabilis*, and in good plants often approach in size those of *var. Rimestadiana.* It is rather difficult to grow, and has a tendency to die off after two or three years.

Terrestrial Orchids are numerous, but most of them are not considered suitable for an Orchid collection, and in any case, the North Queensland species are much the same as those in the southern latitudes. *Calanthe veratrifolia* is found in many places north in the coastal areas, and in the open forest country at the back of the Dividing Range. *Phaius Tankervilliae* is found in the swampy coastal areas with a variety found by Mrs. Ellis Rowan, and named *Rowanae*, after its finder, by the late J. F. Bailey. It is found in swampy ground near the Murray River in the Tully area, Queensland. Variety *Rowanae* is rather more brilliantly toned than the type.

Another attractive ground Orchid, which grows quite well in the herbaceous border, is *Spathoglottis Paulinae*, which is found near Cardwell, in the Rockingham Bay district. Its deep purple flowers, often borne on a long scape, last well, and the plant is quite an acquisition in the garden. The plant itself is attractive, with

(*Continued on page 17*)

Victorian Cultural Notes

R. BRUCE HOGG, *Brunswick, Vic.*

● During the next three months, March, April and May, the whole of your potting programme should have been completed with the possible exception of a few *Cattleyas*, which have still failed to make roots from the bases of the last growths. It will be all right to pot them in March, but I would be doubtful about re-potting them in April and May, unless you are using heat at night, and can keep them warm and dry. The chief activity of the Orchid grower during these three months is watering, ventilating, and shading. By now some of your "Slippers" and *Cymbidiums* should be making their flower growths. It is necessary to harden off *Cymbidiums* to encourage a maximum of flowers, and I would suggest that water be somewhat restricted, but the plants should never be allowed to become dry, that rather more light be given, and that you take advantage of every possible opportunity to leave the doors of your glasshouse open so that a current of air will pass through. This will have the effect of hardening the half-made growths, from the bases of which the bulk of your flowers will spring. If you over-water and over-shade, thus keeping your plants soft during these months, you will certainly get considerably fewer flowers than would be the case with the foregoing advice.

Young "Slipper" flower buds are extremelv sensitive to water, and the germs carried with water, and it would be wiser to start right now and water only the compost, keeping all water off the foliage. Should you accidentally apply water to the foliage, reverse the pot, and allow the surplus water to run out of the apex of the growth. Without care in this direction the loss of flowers with "Slippers" can be quite 25 per cent., and that is a serious loss, particularly where you are anxiously waiting so see the flower of, perhaps, a plant which you have not previously flowered.

The early flowering varieties of *Cattleyas* should now be breaking into bud and some actually flowering, while others will just be completing their new growths and making their flower sheaths. While the weather remains warm, give your *Cattleyas* an abundance of water on the benches and on the floor, and water the pots only when they appear to be dry. It requires a lot of skill to know instantly whether a pot is dry, but if, while watering, you carefully scrutinise your pots you will notice an entirely different appearance on the outside of the pot with a dry one as compared with a moist one. You should lift pots in your hand, and feel their weight, and at the same time inspect the pots to try to train yourself to subconsciuosly select the dry pots from the wet ones. These dry ones are those which should be watered, and the wet ones should get only little, if any, moisture. Should a pot become very dry, it is most difficult to bring it back to its proper condition with the hose. In such cases the entire pot should be dropped in a bucket of water, and soaked for a few minutes.

These three months are critical ones from the point of view of disease, and I would recommend every grower, during this period, to lift every pot out of the house, and scrub the outside of each pot with a scrubbing brush to remove slime and fungus. Mix in a 12½ gallon drum a mixture of one in forty volck and water, and add nicotine sulphate or pestoxol in the proportion of about one in sixty. Dip your plant in this mixture, shake the surplus fluid from the leaves and lay it on its side until it dries. You should then have controlled all scale and insect pests which may be preparing to attack the plant. While the plants are out of the house it is also a good opportunity to thoroughly clean your benches, and, if it is required, to paint the inner woodwork.

As the heat of the sun wanes during this period, so you should be less careful with your shading, and you should seek, particularly for your *Cymbidiums* and *Cattleyas*, as much sunlight as possible, provided that you do not raise the temperature of the house abnormally, but, during March and April at least, if you have to leave your glasshouses while absent at work you would be safer to have the blinds down before you leave.

It is not possible to give instructions for miscellaneous Orchids in these cultural notes, but I will be pleased to reply to any written query which may be put forward. Alternatively, the query could be sent to the Secretary of the Victorian Orchid Club, but, generally speaking, if you give *Miltonias* and the *Odontoglossum* family the same treatment as "Slippers," and the *Dendrobium* family the same treatment as *Cattleyas* with the exception that they must be kept completely dry during the winter, you will not be far out.

Stimulation of Orchid Growth

J. N. SKERMAN, *Maleny, Q.*

● Following on my article on the above subject, I regret to say that prior to my last report I had the misfortune to lose my home through the devastating agency of fire. I also lost nearly a dozen of my best plants, which were developing their blooms, and which had been transferred to the house to reduce risks of prowling insects of the night. This calamity was omitted from my last report, hoping that time might be found to follow closely the application and attention required by the plants, and at the same time to be able to clean up the debris of the fire and build another home. This work, however, for one pair of hands, proved too formidable, and the experiment has had to stand in abeyance for a year. The fire also deprived me of the necessary equipment, and indicator for determining the pH value of the stimulant. This was unobtainable through usual trade channels, the difficulty being overcome only through the patient efforts of the Honorary Secretary of the Queensland Orchid Society, but the growing season was over on its receipt.

Fortunately, the two plants of *D. nobile* were in the bush-house, and escaped destruction. Both were repotted after writing my last report, as one was riding on the edge of the pot. Larger wooden baskets were used. The wires of the wooden basket in which one of the plants was growing, were cut, and the pieces of wood removed one at a time to avoid any possible damage to the roots. The other, which was of earthenware, was fractured with a hammer around the bottom edge, and the pieces which were loose removed and the old compost shaken out. Pieces of earthenware with roots attached were allowed to form part of the new compost to avoid damage to them. Both plants have their new roots well established throughout and over the baskets. They did not have any other treatment since throughout the year, and are looking splendid.

The growths, which only started in November, as stated in the last report, are 21 and 16 inches respectively, not counting leaf length. The numbers of blooms for the season were 209 and 35, but a number were lost through want of time and vigilance to counter the ravages of the green fly or aphis. It is obvious that the length to which the bulbs can be nursed will depend largely on the length of the growing season, which is regulated by the vagary of our winters. A resort to a hot-house may be a regulating factor to counterbalance this and even-up seasonal growth, but departing from the ways of nature may not produce the desired result.

A report was made some time ago on watering plants with water at room temperatures as against water below, and the result was given as a negative response; in fact, it said that in one instance the plant responded to the colder water better than those treated with room temperature water. A query can then be made of this indifference: Does the increased rest a plant gets naturally through a severe winter corresponding to its natural habitat benefit it, and whether forcing it through hot-house treatment would bring about a reaction and militate against its constitution? We do not like being overworked ourselves, and is not the natural instinct in the plant better fixed than in us?

Another year's response is in the offing.

28/11/1944.

● At the Tenth Annual General Meeting of the Orchid Society of New South Wales, held on Thursday, October 26, 1944, the following officers and committee were elected for the year 1944-45: President, E. A. Hamilton; Vice-Presidents, C. C. Hildebrandt, Dr. J. A. Vote; Hon. Secretary, T. H. James; Hon. Treasurer, J. Bisset; Asst. Hon. Treas., W. Fahey; Hon. Editor (*Australian Orchid Review*) and Librarian, P. A. Gilbert; Committee, C. Cambourn, F. Douglas, L. F. Hawley, E. L. Hayes, S. C. James, A. B. Porter, W. Worth.

(*Continued from page* 15)

its long, lanceolate, prominently ribbed green leaves, tapering to a long petiole, and springing from a small tuber. We have, too, a couple of species of *Goodyera—viridiflora* and *polygonoides,* both of them handsome, but difficult to transport and grow. There is also a native *Anoectochilus* reported from two places on the Atherton Tableland (Kuranda and Ravenshoe), but as (so far as I know) there is only one plant in existence at the present time, it is not worth wasting time looking for specimens just now.

There are hundreds of other Orchids in North Queensland, and I have no doubt that many others will be found when the world returns to sanity, and it is one of my hopes that I may be able to search these unexamined jungles in the far north, and round the Gulf of Carpentaria in the quest for new specimens, and perhaps new genera.

Orchid Awards (1944)

The following awards were allotted by the Judging Committee of the Orchid Society of N.S.W., for the year 1944. Descriptions by Dr. J. A. Vote and P. A. Gilbert.

Highly Commended, awarded to *Cymbidium* x *Euterpe* var. *Churchill*. Owner and grower, Mr. R. Dart. 10/8/1944. Sepals and petals symmetrical in arrangement. Measurement across petals 4⅜ inches. Exceptional colour. Petals ¾ inch broad. Sepals 1 inch broad. Labellum prominent, small with broad band of colour 7/16 inch deep, extending around the apex. Labellum ¾ inch across widest part. Habit of raceme rather bunched, no symmetry in arrangement, stem strong and semi-erect; two racemes, average 12 flowers. Constitution of plant moderately vigorous.

Award of Merit, awarded to *Cymbidium x Cassandra* var. *Evadne*. Owner and grower, Dr. J. A. Vote. 31/8/1944. Plant—good habit of growth, and reasonably free. Raceme—semi-erect, floral display good, 9 flowers to raceme. Flower—well balanced, almost circular in shape. Sepals and petals compact, the dorsal sepal erect. No furl, no reflex in petals. Size of flower—4⅝ inches across by 4⅜ inches; sepals 1⅜ inches, petals 1¼ inches. Colour—soft pearly white, flushed with rose. Texture—firm and solid. Labellum—fully displayed, 1⅜ inches at widest part, blunt at tip, well rounded, and devoid of recurving. Edged with rose, central red stripe, irregular small blotches and spots over front half. Column—red, cream tip.

Cultural Certificate, awarded to *Lycaste costata*. Owner and grower, Dr. J. A. Vote. 31/8/1944. The plant had been grown from two small pseudobulbs 1¼ inches by 1 inch, and in the succeeding three years of growth had shown a marked increase in the size of the pseudobulbs, although the leading pseudobulb had made two growths. The forward pseudobulbs measured 4 inches by 3 inches by 1⅝ inches. Two pseudobulbs carried 27 blooms, 10 from the base of one, and 17 from the base of the other. The waxy, creamy green flowers do not open fully. Flowers measured 3 inches by 2 inches; strongly perfumed. The mass of blooms made it difficult to see the pseudobulbs, and the top of the pot.

First Class Certificate, awarded to *Cymbidium Lowianum x Flamenco*. Owner, Dr. K. Kirkland. 28/9/1944. Flower—size 3⅝ inches across petals, 3⅛ inches from the tip of the dorsal sepal to the level of a line drawn from the tips of the lateral sepals. Sepals 1¼ inches wide. Petals 1⅛ inches wide. Labellum ⅞ inch at widest part. Colour—ground colour creamy pink, heavily flushed in most of the areas of all segments with a bright rose pink, faintly lined with deeper rose, the general effect of the colour being rose pink. Labellum—same ground colour as perianth, but heavily marked with crimson band about ¼ inch wide, ending in large blotches towards the keel. Edge of labellum rose, centre red line. Column—dorsally, wine coloured; ventrally, cream spotted pink. Shape—flower well balanced, almost round; sepals and petals almost equal in size. Dorsal sepal erect. Labellum fully displayed. No furl in sepals or petals, fairly rounded at distal ends; no reflex. Texture—excellent. Display on raceme, even and good; raceme semi-erect. Florescence—good, 9 flowers; a plant of two pseudobulbs, vegetative habit only fair, does not appear free.

Cultural Certificate, awarded to *Oncidium flexuosum*. Owner and grower, Dr. J. A. Vote. 30/11/1944. The original pseudobulbs were small, oval; 1 inch by ¾ inch. Each pseudobulb had been cut, making new growths double the size of the original ones. Each of the new pseudobulbs was 2¾ inches by 2 inches by 1 inch, and carried long broad leaves. The plant carried two panicles, one with 8 branches, and one with 7, these again branching 2, 3, or 4 times. Each panicle carried from 90 to 100 blooms. Flowers about 1 inch by ¾ inch; most of the flower is made up of a broad, pure yellow labellum; petals yellow barred with brown, small and insignificant. The plant was grown on a block of tree-fern fibre in a heated glasshouse; luxuriant in growth, making a very attractive display.

● Back numbers of the Australian Orchid Review are still available, excepting seven issues, which are Vol. 1, Nos. 2 and 3; Vol. 2, No. 1; Vol. 3, No. 3; Vol. 4, Nos. 2 and 3; Vol. 7, No. 2. Copies of Vols. 1, 2, 3 and 4 are priced at two shillings each, Vols. 5 and 6 one shilling and ninepence each, and all subsequent issues one shilling and sixpence each.

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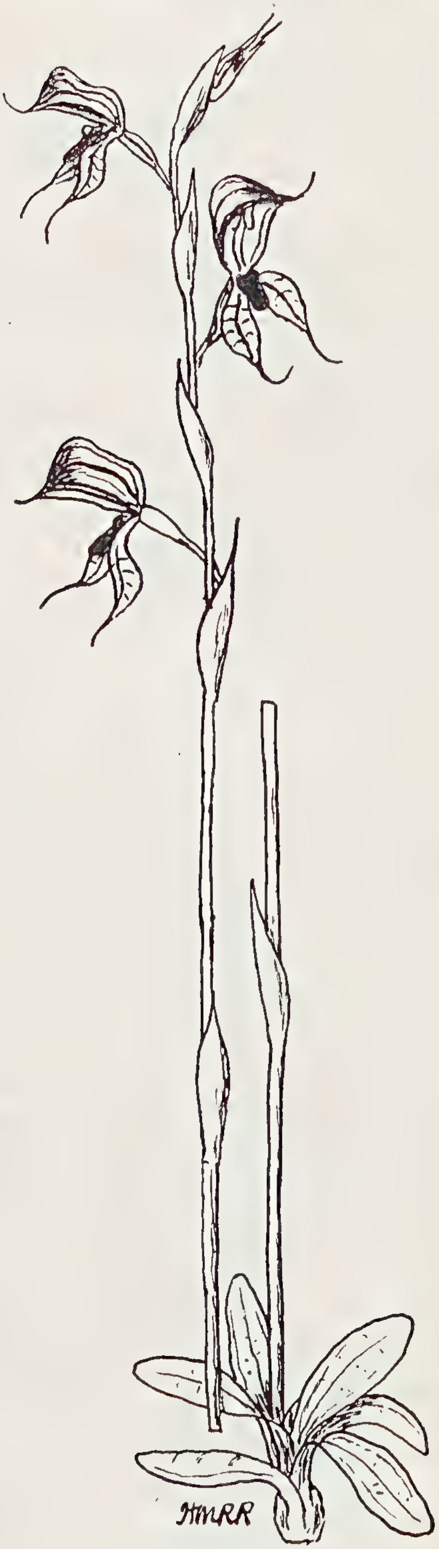


Pterostylis Mitchellii Lindl.
Rookwood, N.S.W.

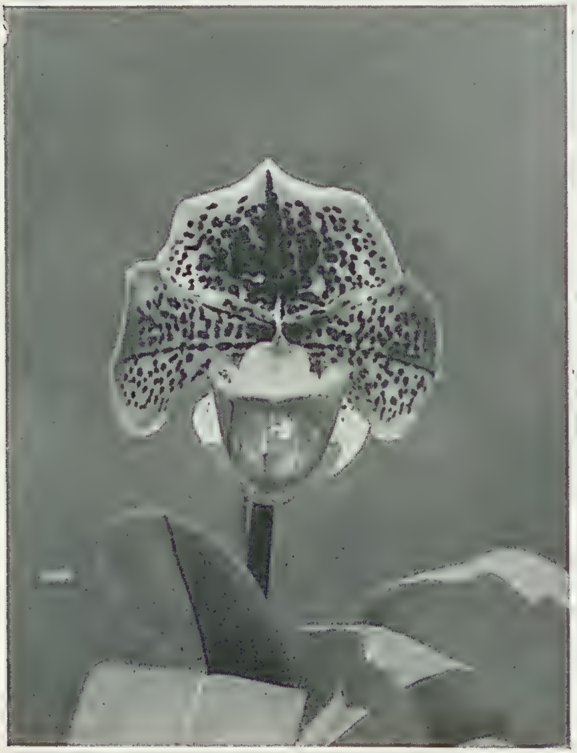
A Sydney Suburban *Pterostylis*
(P. Mitchellii Lindl.)

Rev. H. M. R. RUPP, *Northbridge, N.S.W.*

● I had an unusually lucky experience in the spring of 1944. I wanted a few specimens of the little grassland *Pterostylis mutica* R. Br., and knowing that this species had been collected not far from the Rookwood Crematorium, I went out there in August to collect, if possible, a few plants which might be potted, and so come to maturity under my own observation. There were numerous *Pterostylis* rosettes about, with flowering-stems just showing up, all of which looked more or less like *P. mutica*. So I dug up six plants, brought them home, and put them all into one pot. In due time two developed into good specimens of *P. mutica*. Three others came along later, revealing themselves as the sturdy *P. pusilla* Rogers var. *prominens* Rupp. The sixth plant was later still, and was obviously not identical with either of the other species. Early in October it produced its flowers, and proved to be the tallest and largest specimen of *P. Mitchellii* Lindl. I had ever seen. Thus unwittingly I had provided myself not only with the species originally sought, but also with two others which were, to me, even more desirable. I had no idea that either of them occurred so close to Sydney. I may have more to say about *P. pusilla* var. *prominens* later, as I am now in accord with the opinion expressed by the late Dr. Rogers, that this form should be separated from *P. pusilla* and given specific rank.

P. Mitchellii, named by Lindley after Sir Thomas Mitchell, is a variable species belonging to the "rufous" group of *Pterostylis*. It has a wide distribution, being recorded from all Australian States except Tasmania; yet it is seldom collected, and cannot be called common. In its finest form, such as the one found at Rookwood, it is decidedly attractive, with deep red-brown tints and veins on a translucent-green background. It extends inland far beyond the Dividing Range in Eastern Australia, but the inland form is usually wholly green, and the flowers are smaller. The labellum, which is commonly described as slipper-shaped, is extremely irritable, and springs back against the column at the slightest touch. Like the labella of other members of the rufous group, it is furnished with several long translucent setae or hairs. I have only collected it in three localities — Warialda, South Maitland Coalfields, and Rookwood; but I have herbarium specimens from

South and Western Australia, and in the National Herbarium at Sydney there are specimens from Inglewood in Queensland. I have seen no Victorian specimens, but it is well known to botanists there. Fitzgerald did not interpret the species correctly, and the plant figured by him under this name in Austr. Orch. I, 6 (1880) appears to be a form of *P. pusilla.*



CYPRIPEDIUM X CARCROFT X MAORI
A fine hybrid (not fully out)
Grown and photographed by R. Vick, Vic.

● *Pterostylis celans,* a new species described by H. M. R. Rupp in the Victorian Naturalist, Vol. 61, October, 1944. Recorded from Portland, Victoria.

● *Correction.*—In Vol. 9, No. 4, page 58, right-hand column, fifth line, read *Novae-Zelandiae* for *Novae-Zealandiae* (The Native Orchids of the County of Cumberland, N.S.W.).

● Editorial matter, M.SS., and photographs, should be sent direct to P. A. Gilbert, Hon. Editor, *The Australian Orchid Review,* 37 Colin Street, Lakemba, New South Wales.

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"The above copy is being run in the American Orchid Society Bulletin, The Orchid Digest, and The Orchid Review. We are repeating it here merely to inform our Australian friends as to the type of our offerings. We understand that we cannot accept any orders from Australia at this time."

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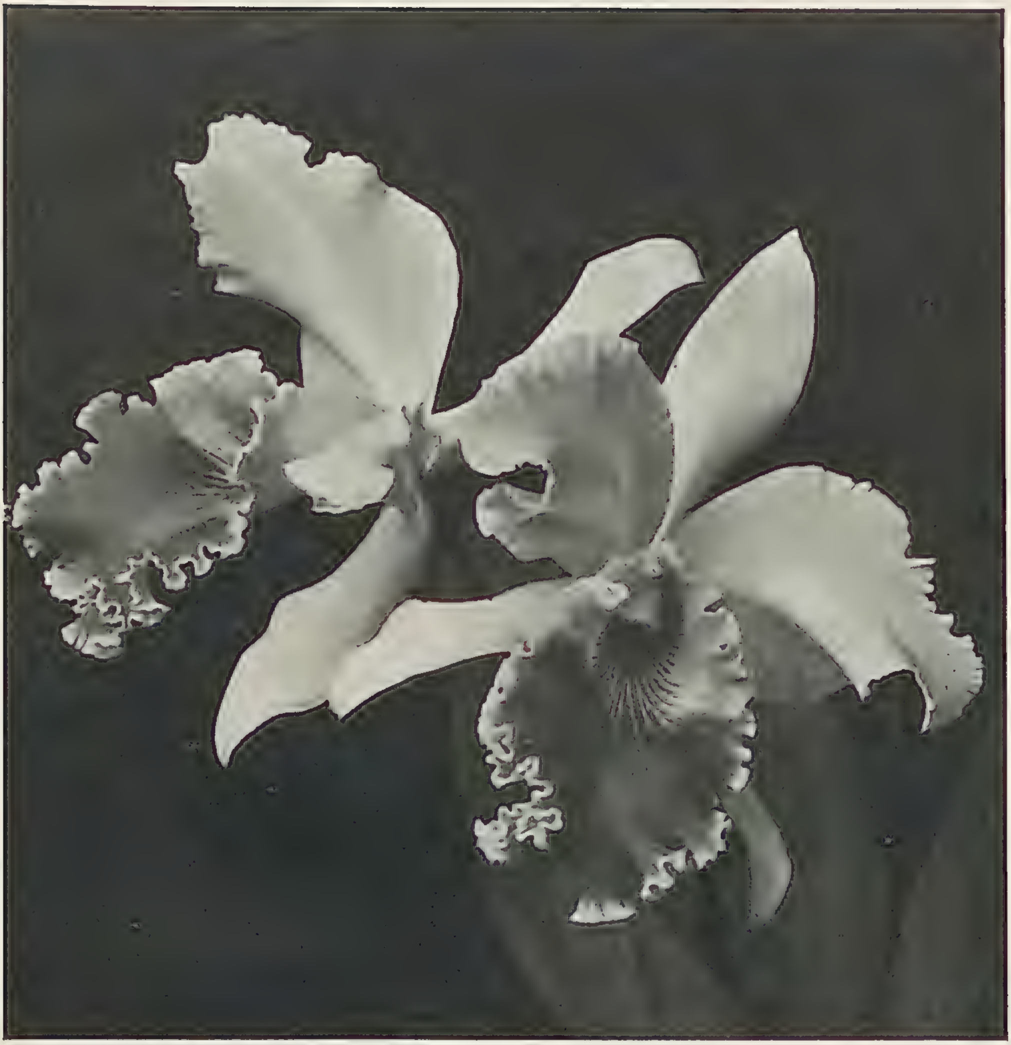

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The Recognition of Some Australian Orchids

TREVOR E. HUNT, *Ipswich, Q.*

● The first question we ask ourselves upon coming across an Orchid in our rambles is "What is it?" That question very often remains unanswered unless the finder happens to possess a well-informed friend who can enlighten him. Unfortunately, there is no up-to-date work on Queensland Orchids. Let us hope that the post-war years, and a broader conception of education, will bring with them a wider interest in the wild life of this State. The idea of this paper is to assist, however slightly, those who are interested in our native Orchids. Obviously, I cannot cover very much ground, but will try to go, as comprehensively as possible, into one aspect of the matter.

As you know, it is impossible to identify, with certainty, any Orchid unless blooms are present, as species are separated only by floral differences. However, it is possible to be *fairly* certain of the identity of a plant without its flowers. Putting aside the possibility of new species, quite a large proportion of species can be identified very easily by some pronounced peculiarity, and many others by slight divergences from these. It is upon this aspect that I shall dwell. Space will not permit me to go into detailed descriptions of species, nor would your patience last me out, so I must assume you have a general idea of the main groups.

Most Orchid lovers in Queensland commenced their collections of native species with the Dendrobes, so let us follow suit and lead off with the so-called "pencil" group. They derive their common name from their long, graceful, cylindrical leaves. These leaves are sufficient to identify the whole group. There are only five Queensland species. *D. teretifolium,* with smooth leaves from nine inches to almost two feet long; *D. Mortii,* which is similar to the first in habit, but with leaves under six inches long, channelled slightly, somewhat angular, and little thicker than a match; *D. Grimesii* has leaves about the size of *D. Mortii,* but thicker; *D. tenuissimum,* which is hard to distinguish from *D. Mortii,* but has much more attenuated stems, thinly clad with slender scales, and the leaves are not angular; finally, there is D. *Beckleri,* which is easily distinguished by its short, stout, strongly ribbed leaves and its tendency to hold its leaves upright until the stem grows long enough to assume a pendulous habit. The plant named by Bentham, *D. Bowmanii,* was so named in error, and is really *D. Mortii.*

Another distinctive type of growth is shown by *D. monophyllum* and *D. Schneiderae.* Here we have creeping stems with many short, conical pseudobulbs. The former plant has bulbs up to three inches and more in height, usually much ribbed, and surmounted by one or two lance-shaped leaves, while the latter is very much smaller and less rigid.

Confusion can arise amongst the group comprising *D. Kingianum, D. delicatum,* and the N.S.W. species, *D. Kestevenii,* and their varieties. Generally varieties can only be separated from species when in bloom. There is no form of *D. Kingianum* which attains the size of *D. delicatum,* although both are variable in this matter, particularly the former, which ranges between a few inches and almost a foot. *D. delicatum* and *D. Kestevenii,* in point of size, are about midway between *D. Kingianum* and *D. speciosum.* The well-known *D. speciosum,* which is commonly called "Rock Lily," has been split up into at least seven varieties and forms, differing mostly in floral make-up, which point does not concern us at the moment. Although there seems to be a certain amount of confusion in this species, perhaps a rough rule for separating them could be as follows:—*var. Hillii,* taller than the type, up to three feet, stems fairly slender and almost even diameter throughout their length—this includes its forms, *Bancroftianum* and *grandiflorum.* The type, i.e., *D. speciosum* itself, has shorter, very stout pseudobulbs; but if *all* the pseudobulbs are strongly curved the plant could be the *var. curvicauli. Var. gracillimum* is a tall, slender plant with pseudobulbs ½-¾ inch in diameter; *var. nitidum* is similar to the last, but the leaves are prominently pitted on the upper surface.

D. Phalaenopsis and *D. bigibbum* and their varieties cannot be separated without flowers except the recent *var. compactum,* which, as its name suggests, is a very short, stout, spindle-shaped form. *D. canaliculatum* has very similar pseudobulbs to the last, but has several fairly long, very fleshy, narrow leaves deeply channelled, while those of *D. Phalaenopsis var. compactum* are like those of the type—lance-shaped, thin, and leathery.

D. Tofftii and *D. undulatum* both have stems up to about four feet, swollen above the base, and narrowing again towards the top, but the former is prominently marked with purple ribs. Both have broad, thick, nearly circular leaves. *D. Johannis* also has purple markings, but is a very much smaller plant with narrow, leathery leaves. *D. superbiens* is very similar to the first two, but has much narrower, thinner-textured leaves.

D. fusiforme, as its name suggests, is a true spindle shape, i.e., narrow at each end and swollen in the middle, and is also deeply corrugated. It is generally less than twelve inches high, but may be a little more.

D. tetragonum is very easy to distinguish, as its pseudobulb is four-sided, very thin at the base, and widening slowly to a very much greater diameter. It is very variable as to size, ranging from about four inches to over a foot.

D. aemulum, *D. Bairdianum*, and *D. Wilkianum* are somewhat similar in growth. The first is practically cylindrical in shape, blunt at the leaf end, and tapering sharply at the end nearest the host, and carries two or three short, broad, thick leaves. The second may be furrowed, and its leaves are much narrower, keeled, and striate. The last is slightly swollen in the middle.

D. gracilicaule, with its long, slender, cylindrical stems is well known to those who frequent the scrubs.

D. Fleckeri and *D. Adae* cannot be separated without flowers, and both resemble small and very slender *D. gracilicaule*, but the stems are darker.

D. Carri is peculiar in that the stems are elongated and creeping, rooting below the widely spaced pseudobulbs, which are small, club-shaped and deeply furrowed, carrying one or two slender, thin-textured leaves.

D. falcorostrum is a more robust plant than *D. gracilicaule*, with lighter green leaves.

D. Prenticei, *D. variable*, and *D. aurantiaco-purpureum* cannot be separated without flowers. They have creeping rhizomes, tiny pseudobulbs, each carrying a thick, fleshy leaf about an inch long, which is almost terete, tapering at both ends, i.e., cigar-shaped.

Another distinguishing type of growth is displayed by *D. linguiforme*, *D. cucumerinum*, *D. rigidum*, and *D. lichenastrum*. The first could be described as possessing creeping stems carrying fleshy leaves up to two inches long, and very broad, varying from almost circular to almost half-moon-shaped. The second has a similar type of growth, but the leaves are shaped like miniature prickly cucumbers. The third has leaves similar to those of *D. linguiforme*, but its method of growth is different in that it has pendulous branches. *D. lichenastrum* creeps in the manner of *D. linguiforme*, but is an almost minute plant with glossy, densely crowded, almost orbicular leaves.

D. pugioniforme has a rambling habit with long, pendulous, thin stems carrying broad, thick and rigid leaves which taper to a very sharp point, suggesting a short, broad-bladed dagger.

D. Smilliae has a growth on the lines of a small *D. undulatum*, but the stem, which grows to about two feet in length, is very strongly furrowed, and its leaves are lance-shaped and thin-textured.

D. ophioglossum has stems which are very thin and cylindrical, bearing several fairly fleshy lance-shaped leaves, which are sharp pointed and double-toothed.

D. Stuartii has slender, striated stems up to 18 inches long, carrying many short, narrow, erect leaves.

D. agrostophyllum has slender, deeply furrowed stems up to two feet high, rather distantly spaced on a creeping rhizome. The leaves are erect, lance-shaped, thin and up to four inches long.

D. Baileyi has slender cylindrical stems, which are very narrow at the top, about 1/10 inch, carrying many fairly long, grass-like leaves.

D. Keffordii forms masses of slender stems up to four inches high, which may carry leaves from top to bottom. The leaves are about three inches long and ¼ inch wide, tapering and leathery.

D. fuscum has robust stems two feet to six feet high, swollen in the middle. It has leaves only at the top. They are broadly oval, thick, up to four inches long, with recurved margins, notched at the tip, overlapping and grasping the stem.

It is of the utmost importance that care be taken, when attempting to identify plants which are not in bloom, that only well-grown, fully developed plants be used for making comparisons. This is particularly true with the above genus, many species of which commence to bloom long before they reach their maximum development. It is also as well to remember that adverse growing conditions produce stunted plants, which could be mistaken for other species.

Let us discuss, now, a few more genera.

There are two *Oberonias*. They have an Iris-like growth, showing no stem, and with the tapering leaves wrapping round the base and the lower parts of those above them.

O. iridifolia is a green plant with leaves above three inches long. *O. Titania* is a green to russet-coloured plant with leaves under two inches long.

The *Bulbophyllums* produce creeping rhizomes with small, generally round, pseudobulbs surmounted by one or two leaves. Let us take first those which have outstanding characteristics, and so are easily distinguished.

B. crassulifolium has fleshy leaves like large green grains of wheat.

B. intermedium is a doubtful species similar to *B. crassulifolium.*

B. minutissimum has pseudobulbs little larger than a pin's head.

B. globuliforme has pseudobulbs even smaller than *B. minutissimum.*

B. MacPhersonii has bulbs a little larger than those of *B. minutissimum,* but whereas the leaves of the latter are hardly discernable, those of the former are up to an inch long, grooved and thick.

B. Toressae is a very tiny plant with pitted, sharp-pointed, rather broad leaves, which are so concave on the upper surface as to be almost like a boat.

We can split the balance of the genus into groups according to the texture of their leaves. Some of those already discussed also show the following characteristics, but they are more easily distinguished by those factors which have set them apart. We will divide the balance, then, according to the texture of their leaves, whether fleshy, i.e., thick and juicy like a cactus; leathery, i.e., thin and pliable; and, finally, one plant which possesses leaves which are thick through but could not be called fleshy.

B. aurantiacum is the only catch, as the southern form has large fleshy leaves nearly ¼ inch thick and channelled, while the northern form has thin, leathery leaves. The stems are long and creeping, and the bulb quite tiny compared with the large leaf.

B. nematopodum and *B. Bowkettae* both have fleshy leaves and bulbs much the same size, perhaps larger in the latter, but those of the former overlap each other and *nematopodum* has leaves up to 5 inches long, and those of *Bowkettae* are oval and only half an inch long.

B. Baileyi is the only one not already accounted for with *thick* leaves. It has quite a large bulb, up to an inch in diameter, with four-inch leaves.

In the group with leathery leaves *B. radicans* and *B. Elisae* both have leaves up to two inches long, but the former has a hairy stem and small, wedge-shaped bulbs, and the leaves are narrow, while the bulbs of the latter are over half an inch in diameter.

B. exiguum, B. Weinthallii and *B. bracteatum* complete the list. The first is easily the smallest, with a tiny half-inch leaf and bulbs the size of a small pea. The other two both have leaves about an inch long, but the bulbs of *Weinthallii* grow to about ¾-inch in diameter, and those of *bracteatum* do not exceed half an inch.

Next let us take a group of terrestrials with somewhat similar, large, more or less strongly ribbed leaves.

There are two species of *Spathoglottis.* Both are ground dwellers, with subterranean rhizomes, smallish pseudobulbs and long, narrow, strongly ribbed leaves. *S. Paulinae* has leaves over two feet long and about 1½ inches wide. *S. Soutteriana* has leaves less than two feet long and ¾-inch wide. A distinguishing feature is the absence of a blade on the outermost leaves. *Phaius Tankervilliae* is a well-known terrestrial frequenting swampy areas. It has relatively small pseudobulbs bearing several very long, very broad, strongly ribbed leaves which are dark green.

Calanthe veratrifolia is a very similar plant to the above, but, liking its roots drier, is generally found in the higher scrubs, in this district, anyway. Its leaves are generally smaller than those of the above, and of a distinctive pale silvery green.

Geodorum pictum also has this type of growth and is generally found in drier, sandy, more open country. It is a smaller plant than either of the other two.

The *Cymbidiums* should give no trouble.

Cym. suave has long, thin, pliable leaves, and no swollen pseudobulbs, as is usually found in this genus, but leans more toward the *Vanda* type of growth.

Cym. iridifolium also has long, thin, pliable leaves, but has very large pseudobulbs.

Cym. canaliculatum also has pseudobulbs, but the leaves are very thick, rigid and deeply channelled.

At present there are four species of *Dipodium.* They are terrestrials without leaves in three of the species. *D. punctatum, D. Hamiltonianum* and *D. stenocheilum* (which last the Rev. H. M. R. Rupp proposes shortly to reduce to a variety of *D. punctatum*) do not bear leaves. *D. ensifolium* has leafy stems.

The genus *Sarcochilus* can be divided into two main groups for the purposes of this paper, viz., those with broad leaves, and those with narrow leaves.

In the first group:—

S. Hartmannii is a rock dweller, with dark green, thick, channelled leaves. It forms large clumps.

S. *Fitzgeraldii* is the only other rock dweller in this group. Its leaves are light green, thinner textured, and practically flat and slightly sickle-shaped. It also forms colonies, and has a branching habit.

S. *divitiflorus* is one of the easiest Orchids to identify, as its roots are very rough, giving it its common name—Raspy root.

S. *falcatus* has pale green, thick leaves, which are strongly sickle-shaped.

S. *olivaceus* has dark green, thin leaves, which are sickle-shaped.

S. *dilatatus* is indistinguishable from S. *olivaceus.*

S. *Longmannii* is like a small S. *falcatus.*

S. *Weinthallii* is distinguished by its white roots.

S. *australis* suggests a small specimen of S. *olivaceus.*

S. *spathulatus* is similar to S. *australis,* but smaller.

The narrow-leafed group comprises:

S. *Ceciliae,* the only rock lover of the group. Its channelled leaves are dark brownish-green. It forms colonies.

S. *Hillii* has light-green, spotted leaves.

S. *eriochilus* is similar to S. *Hillii,* but the leaves are channelled.

Chiloschista phyllorhiza is apparently leafless and stemless, and could be confounded with *Taeniophyllum Muelleri,* except that the former has flattened roots.

All the genus *Sarcochilus* are characterised by having short stems carrying below the live leaves the dried remnants of the dead ones. *Ornithochilus Hillii* has the same general appearance as a *Sarcochilus.* Its leaves are flat, light green, up to five inches long and one inch wide.

Eight of the following nine plants until recently made up the genus *Cleisostoma,* from which six were removed by H. M. R. Rupp.* The ninth, *Thrixspermum platystachys,* was removed from the genus *Sarcochilus* by Schlecter. Their method of growth is somewhat similar to that of *Sarcochilus.* I can think of no particular grouping to facilitate identification.

Sarcanthus tridentatus is the well-known "Tangle Orchid," which generally distinguishes itself by hanging from its host by means of one or two long roots, with many others tangled round it in an untidy ball. The stem is long, the leaves up to three inches long and ¼-inchwid

Sarcanthus MacPhersonii has a short stem with leaves up to six inches long, one inch wide, and keeled.

Saccolabium brevilabre has a long stem, with leaves up to three inches long and one inch wide.

Saccolabium orbiculare has a short stem, with leaves about two inches long and half an inch wide.

Camarotis Keffordii is distinguished by having a rather slender but rigid stem growing to several feet, with very thick leaves four inches to 6 inches long and one inch wide, blunt.

Thrixspermum album can easily be distinguished by its persistent flowering stems, with the inflorescence bunched at the top. Capsules to three inches long. Has a short stem with small, thick leaves, strap-shaped, about one inch long and ¼-inch wide.

Thrixspermum platystachys has a long stem up to two feet, with leaves up to eight inches long and two inches wide.

Cleisostoma Armitii is a practically unknown plant. It is small, with leaves about two inches long and half an inch wide.

Cleisostoma Nugentii has a short stem with leaves up to two inches long and half an inch wide, which are keeled.

The genus *Galeola* has two species. They are completely leafless, and may be found climbing up trees or rotten stumps, to which they cling by their adventitious roots.

Galeola foliata is the larger of the two plants and can be distinguished from the other by its possession of bracts, resembling leaves, at the branches.

G. *cassythoides,* besides being smaller, possesses no bracts, and is of a chocolate-brown colour.

Schoenorchis densiflora resembles somewhat a very diminutive cylindrical-leaved *Dendrobium.*

Luisia teretifolia is an erect, cylindrical-leaved epiphyte which might be mistaken for a young *Vanda teres.*

Life Member.—During the past year it was the pleasure of our Society to confer the honour of Life Membership on Mr. E. J. Beard, in recognition of his valued service and great interest in the welfare of the Society since its inception. Of latter years Mr. Beard has acted in the capacity of Honorary Treasurer, and has taken great care of the Society's finances. We doubt if any person in Australia has been cultivating Orchids for such a long period as our esteemed friend.

(Extract from the Queensland Orchid Society's Annual Report, 1944.)

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*See Vic. Nat., Vol. LVII, p. 216. (*The Breaking-up of the Genus Cleisostoma in Australia,* by H. M. R. Rupp.)—P.A.G.

A Little Light on Cymbidiums

F. DOUGLAS, *Mosman, N.S.W.*

● The original object of this article was to provide relaxation and recreation, by writing on paper an appraisement of the effect of light, heat, air, moisture, and rooting medium on Sydney's *Cymbidiums.* Perhaps it would clarify, if not eradicate, many of the doubts and uncertainties which frequently beset me when forming a mental plan of how to, and where to, grow my *Cymbidiums.* It is published in the hope that it may provide similar interest, stimulate thought, and in that way amuse or benefit others.

The authority used is the "Encyclopaedia of Gardening" (Second Edition), Editor, A.C.L. My personal observations have been made during a lifelong practical experience growing plants in various countries. The intention is to consider the various necessities of plants, taking each factor separately, and then subsequently in combination.

Light, being first on the list, will receive prior consideration. If we appreciate what it is, and what it does, then check by local observation of trial and error how our *Cymbidiums* respond or react to it, we should arrive at a conclusion permitting us to decide with reasonable prospects of success, what particular aspect is preferable, so far as light alone is concerned.

The light we are concerned with is the rays from the sun. The intensity of the rays, which may be direct, indirect, or a combination of either, is a necessary principle of plant growth when green leaves are produced. The intensity of direct light varies considerably, owing to the humidity and impurities of the atmosphere; the further from the equator and the higher the elevation the more intense is the light, and the more is the variation of its duration. The rays are absorbed, bent, reflected, defused, or concentrated according to the reflective properties of the various surfaces or objects upon which they impinge.

Vegetation uses the rays, it absorbs the light. If you doubt it, take the plants out of your glasshouse and watch the thermometer rise. We have all seen the effect on plants having unclean foliage and when the light reaches them through poor, faulty, dirty, or obscure glass, and know what a bottle, mirror, or magnifying glass will do in the bush on a clear, dry day, also noted the different reflections arising from water, sand, rock, glass, cement, snow, light colours, etc.

The impinging of sunlight generates heat, but we can forget that aspect at the moment; it will receive consideration later. Meantime it is convenient to separate that factor. After all, the most intense sunlight is above the snowline, where ice abounds, and when the thermometer registers zero or under, also that humans as well as plants use artificial or incandescent light without heat to augment or substitute.

Light in adequate intensity is necessary for green-leaved plants. It manufactures the food within the flower stems, leaves and body by converting the circulating sap into the preliminary of plant tissue. In doing so it gives firmness to the leaf and plant, subject to other factors it controls, ripens and matures growth. The firmness or maturation of the growth bears a direct relation to the subsequent initial movement, and to flower production (smaller flowers and fewer spikes are produced on immature or unfirm growths) it is conducive to growth and health. Darkness is the counterpart, a deficiency weakens the constitution of a plant, disorganises its season of rest and growth, and predisposes it to internal breakdown through the vicious circle of weak growth, insect pests, bacterial attack and virus disease. Light also activates the atmosphere, effects moisture, humidity, and heat, but may have a retarding influence on roots, germinating seed, dormant back-bulb, and inactive division, because the initial movement of each is determined by the other factors, and at that stage light is not a necessity; nevertheless it has a beneficial effect on the compost or medium by encouraging the action and supremacy of the the desired bacteria or beneficial organisms. This may be proved by filling three kerosene tins with an identical unmatured moist Orchid compost, keep one in the dark, another where it receives reflected light, and the other in full sunlight, maintain as near as possible a constant condition of the other factors to each, examine and compare in a month or two. It will be found that they have lost their similarity, and that the material in the sunlight is best, sweet and mellow. The material in the dark may be sour and rotten.

Seed and plants commence their cycle and season of growth requiring nil light intensity, but as they grow their requirement increases to maximum at the autumn of their growth and the autumn of their days (maturity and flower production). The process, like all natural processes, is gradual and continuous. If that is so, and provided consideration of the other factors does not suggest a modification, the aspect of my *Cymbidiums* is determined. Seed, back-bulbs and divisions will be started off on life's journey under shade. When the seedlings develop their character leaves, the back-bulbs a growth with roots, and the division discloses a circulating sap, light becomes a necessity, and a different condition is required. Hence, taking advantage of the season, the weather, and the inherent adaptability of plants, some of the shading will be removed, or their quarters changed. The frequency and extent of shade reductions or transfer will be governed by time for the plant to accommodate and adapt itself, and by its progress, the intended maximum being reached when the plant approaches maturity. With a division the period may occupy one or two weeks or months, a back-bulb one or two years, a seedling four or five years.

In order to discover the maximum or most suitable aspect for the mature plant, we look around us. In nature we find that varieties adopt slightly different aspects; but, taken generally, they occupy or accommodate themselves within well-defined limits—from full to filtered sunlight, never under shade or in full shadow nor in full light when strong reflections are present, although the cause appears to be with the other factors, particularly moisture. The roots invariably avoid the light. Under cultivation in Sydney one may observe them growing under every conceivbale condition of light and shade. That most of them appear quite happy proves their adaptability, and makes it rather difficult to decide which aspect is best. However, if we consider and eliminate the two extremes (a) and (b), we may arrive within their range of accommodation.

(a) A few are encountered under fairly heavy shade or under a shade in shadow. The deficiency of light is obvious to most. The plants have few leads and grow weakly and slowly, the leaves etiolate and lean towards the light, they persist for more than the normal two years, bulbs do not mature, spikes are few, and flowers small and poor in shape; ill-health or disease usually apparent in one form or another. Certain varieties, like *Eburneum* and *Devonianum,* take it better than others.

(b) Due to fences, buildings, trees, contours, and limited areas of city holdings, it is seldom one sees the other extreme of full sunlight; still, the reflections from rock, paths, brick, cement, glass, and light colours set up conditions indeed extreme. Under the combination plants break freely occasionally three or four to one, growth is comparatively rapid during spring or autumn, rest period more summer than winter, our autumn being their spring; leaves short and yellow, non-persistent, in a year or less the ends are lifeless, quite apart from burning, bulbs are small, even when not scalded, spikes numerous with flowers of good shape, but lacking texture and purity, dark colours have depth, disease not common, in fact rare; but plants do not look good. The disadvantages may be traced to the other factors which the light and reflections create, and it makes one wonder if light alone can be excessive when its duration is limited to approximately 14 hours out of the 24.

(c) The great majority are now grown under light, shade providing filtered sunlight. They break progressively (leads occasionally doubled) and grow reasonably well; foliage nice clean attractive green; resting period winter. When they do not flower consistently or freely, and when spikes emanate from the previous season's and not the current growth, it may be taken as a token that there is insufficient light during the autumn of their growth. It requires the two years to manufacture, ripen, and mature the bulb. Floriferousness normal, florescence normal; but we want the best, white and light colours, texture, substance and display are good, size is less, and form not so good when compared with similar receiving full light without reflections, or in an intense situation with light shading.

Observe how the spike and flowers stand up, hang down, turn or twist in order to obtain the most suitable light available, and that the most suitable varies between varieties. The plants look exceptionally good; indeed, they appear better than they really are, because they do not double their growths and their spikes annually, like those grown in (d) full light without reflections or subject to the combination when modified by shadows of tall trees or shading with the density of, say, one-inch netting, which on the other hand lack the attractive appearance. Because bulbs are smaller and foliage short, blemished and an undecorative hard yellow green, the flowers are larger and of better form, but miss out on the texture and purity; greens do not provide that delightful apple green. Don't take my word for it. Test it. On a plant in the sun, with two spikes, enclose the furthest advanced spike in a paper, or set the plant so that the advanced spike is inside the bush-house and the other spike projecting into the open light, and observe results. Search as one will, either a deficiency of light or an apparent excess recurs. There does not seem to be a happy medium which will produce all the desired results from one light aspect. In theory, of course, one could move the plants, and use manipulative shading, etc., but practice rules that out, except where permanent attendance is possible, and even then success is doubtful.

If the object in growing *Cymbidiums* was economic, then the apparent excess light would have the advantage by producing more and hardier plants in less time. The disadvantage is that they may be lost or damaged by other causes. If commercial cut-flowers be the object, excess will produce quantity with the florist quality not unduly affected. On the other hand, if exhibition plants are the aim, partial shading would be the aspect, and the sacrifice floriferousness and a little size and form. If the object is just to grow them for fun and relaxation, then light shading is nearer fool-proof; but my aim is to grow them better, and with the minimum attention. Therefore the decisive aspect cannot be chosen until other factors bearing towards that end have been considered.

Heat will be discussed in the next issue.

Queensland Orchid Society

Office Bearers for 1945

At the Annual Meeting, held on February 9, 1945, the following gentlemen were elected to office for the current year:

President: Mr. C. A. Hilsden (re-elected).

Vice-Presidents: Metropolitan—Messrs. E. J. Beard, L. F. Hayes, and H. Stevens; Country—Messrs. J. McG. Wills (Southport), Trevor Hunt (Ipswich), and T. T. Taylor (Macnade, via Ingham).

Hon. Secretary: Mr. T. C. Harveyson.

Hon. Treasurer: Mr. E. J. Beard.

Hon. Technical Adviser: Mr. C. T. White.

Hon. Auditor: Mr. Keith Tanner, A.C.A. (Australia).

Committee: Messrs. L. C. Home, C. O. Dunn, D. Law, W. L. Haenke, J. Gordon Smith, L. F. Hayes, S. R. Brock, and A. Swensen.

Annual Show.—The Orchid Society of New South Wales will resume its Annual Show on September 12, 13 and 14 (Wed., Thurs., and Friday), 1945, and will be held in the premises of Messrs. Beard, Watson and Co. Ltd., George Street, Sydney. The Show Committee asks members to do their best to make it a success.

Sectional Show.—The Orchid Society of New South Wales will hold a Sectional Show for *Cypripediums* at the Austral Salon, Elizabeth Street, Sydney, on the evening of July 5, 1945.

A new variety of Sarcochilus Ceciliae

Sarcochilus Ceciliae (F. Muell.) *var. albus, var. nov.*—At Tambourine Mountain, South Queensland, I recently encountered a pure white form of the well-known *Sarcochilus Ceciliae*, growing in close proximity to the typical pale pink form. There appeared to be no intermediate; all the plants being either a definite pink or a pure glistening white with no trace of colour, except in the calli, which were yellow.

A critical examination of both types showed other minor variations sufficient to warrant giving the new form varietal standing.

The white variety opens its flowers fully after the manner of *S. Hillii*, which plant it superficially resembles, whereas the typical *S. Ceciliae* tends to retain a bell shape. Again, all the segments of the white variety are narrower than those of the type, and are linear-lanceolate, the petals being narrower than the sepals. The calli of the labellum are clear yellow.

I propose that this variety be known as variety *albus*.

The following is a brief Latin description, for which I am indebted to Mr. C. T. White:

Differt floribus albis late expansis, sepalis petalisque quam in typo angustioribus, petalis sepalis angustioribus, labelli callis flavis.

—TREVOR E. HUNT, 20/3/45.

In the "Victorian Naturalist," March, 1945, the Rev. H. M. R. Rupp raises *Dendrobium speciosum* var. *gracillimum* to specific rank. He remarks that he takes this step in deference to several requests, and a widespread expression of opinion. For some years past the plant has commonly been cited as "*Dendrobium gracillimum*," and this will now be its correct name. The author mentions how it was originally brought under his notice at Paterson, N.S.W., and how the late Dr. Rogers at first identified it with the Lord Howe form of *D. gracilicaule*, but subsequently agreed with Mr. Rupp that it would be more appropriately placed in *D. speciosum*. The character and habit of the plant, however, distinguish it clearly from any other known form of either of these, and therefore it is felt advisable to advance it to specific status.

● Subscriptions for the *Australian Orchid Review*, 6/- (six shillings), should be posted to *Australian Orchid Review*, c/o Shepherd and Newman Pty. Ltd., Yurong Street, Sydney, N.S.W.

"Would you Like to Grow a Few Orchids?"

R. BRUCE HOGG, *Brunswick, Vic.*

● Doubtless, many people in Victoria have often said to themselves, "I would like to grow a few Orchids, but I do not know whether I have facilities to grow them."

The generally accepted idea that Orchids are hard to grow is a myth. They are relatively easy to grow, provided that they are housed under kindly conditions. Some people might aspire to grow a few Orchids on an open verandah, in a glassed-in verandah, on a window ledge, in a fernery, or in a small glasshouse built chiefly to grow begonias, ferns, etc. There is little doubt that the hardy *Cymbidium* species, and the "rock lily," *Dendrobium speciosum*, would grow on an open verandah if in a position where direct sun did not bear on them for a prolonged period.

On a glassed-in verandah quite a few Orchids could be satisfactorily grown if the grower was at all skilled in attending to plants, and reasonable results would be obtained from practically the whole of the "Slipper" or *Cypripedium* species, *Cymbidiums* of all types, and perhaps a *Cattleya* or two hanging from the ceiling. Should you attempt this, the glass should be frosted in some manner, and better results would be achieved if the shelves on which you place the pots had shallow trays on them, say 2 inches deep, filled with coarse sand or shell-grit, the pot being placed upon the top of the sand or shell-grit, and when watering, allow a generous amount of water at all times to keep the sand or shell-grit wet. In this manner you would have much higher humidity surrounding the plants than would be the case with the ordinary shelf in a glassed-in verandah.

On a window ledge you would be confined chiefly to the common "Slipper," *insigne*, but even that plant must go back ultimately. I would suggest that if you aspire to grow a few plants on a window ledge, the wiser plan would be to buy flowering-sized plants in bud, keep them for about six months over the flowering season, sell them again and buy again the following season. This is the time of the year at which to buy flowering-sized plants of "Slipper" species for this purpose.

In the fernery or bush-house, provided that it is not shaded too heavily, you could grow *Cymbidiums* with some success, and certain of the "Slipper" species, and to get the best results, owing to the air movement which takes place through it during warm weather, the plants should be sprayed over and the floor damped down two or three times daily.

In the ordinary garden glasshouse a few "Slipper" species and all types of *Cymbidiums* are worth trying, but here I would recommend that you repeat the suggestion for the glassed-in verandah, and stand the plants on galvanised iron trays filled with about two inches of coarse sand or shell-grit, which is kept constantly moist. This type of glasshouse usually has a large amount of ventilation, and would not require the care in shading that a closed house would, for a well-ventilated house is very slow in generating sun heat.

Of all the better types of Orchids there is no doubt that the *Cymbidium* is most suited to Australian conditions, and the easiest to grow. If shaded from the frosts this species will grow and flower in the open garden, even in Melbourne.

My advice to the beginners who have not yet provided proper Orchid growing facilities is to confine the bulk of their attention to *Cymbidiums* for this reason, and if they follow the advice set out in the foregoing, using *Cymbidiums* as their medium, they should certainly flower their plants.

A word about watering for such unconventional growing. In every case cited the atmospheric moisture will be less than in a glasshouse, and the air movement which carries moisture away far more rapid. For this reason, you should be infinitely more generous in the application of water than is recommended in the Victorian Cultural Notes for growing under proper conditions.

Colour Chart.—Two series of colour plates issued by the Royal Horticultural Society, England, are in the library of the Orchid Society of New South Wales, and are available to members for reference only in determining the colours of flowers.

"North Queensland Naturalist" (incomplete) has been added to the library of the Orchid Society of New South Wales. It is issued irregularly several times in a year, and contains descriptions and field notes of Australian Orchids by well-known authorities.

Memories of an Orchid Lover—III.

REV. H. M. R. RUPP, *Northbridge, N.S.W.*

● My last reminiscences were of Barraba (*Australian Orchid Review*, September, 1941). After leaving that district, I spent several years as a deputation secretary of the Australian Board of Missions, travelling extensively in New South Wales, Victoria and Tasmania. In my journeys I saw much of the flora of areas previously unknown to me; but as a rule my engagements allowed little time for botanising. My home during this period was at Longueville, on the Lane Cove River, and I made the most of such opportunities as I could get between my "tours" to explore the bushlands of that beautiful estuary of Sydney Harbour. Longueville itself, in those days, had still plenty of bush left: to-day most of it is built over. I collected some 70-odd species of Orchids along Lane Cove. Under a tea-tree at Longueville one day I had what was, for a botanist, a curious stroke of luck. Among the "pygmy" species of the genus *Prasophyllum* are two very rare ones, named *P. Baueri* and *P. Deaneanum*, which I had never seen. But that day I found a perfect specimen of each, growing within a yard of one another beneath the tea-tree. I have never seen them in the field since.

During a Tasmanian tour I made the acquaintance of a brother cleric who is also a brother botanist, the Rev. (now Archdeacon) H. B. Atkinson, who finally persuaded me, upon terminating my engagement with the Board of Missions, to act as his *locum tenens* at Holy Trinity Church, Hobart, when he went abroad for twelve months. After his return I accepted charge of a Launceston parish, and stayed in Tasmania for another two years. During these three years I was able to devote much of my spare time to the study of the Tasmanian flora, which I found very fascinating. With two exceptions (*Dendrobium striolatum* and *Sarcochilus australis*) the Tasmanian Orchids are all terrestrials. The summit of the hill known as Knocklofty, behind the city of Hobart, was one of my favourite resorts; there grew the beautiful Spider Orchid, *Caladenia Patersonii*, in myriads, often perplexingly variable. Mount Wellington and Mount Nelson, too, could always be relied upon for Orchid treasures no less than for the charm and glory of their scenery. I still have in my herbarium an unidentified *Thelymitra* from Mount Nelson which I believe to be an undescribed species; but neither I nor, apparently, anyone else has ever found another, so it is still nameless.

In the neighbourhood of Launceston my chief haunts in spare hours were in the vicinity of the Punchbowl and along the Westbury Road. I believe that most of my Orchid lands in the former locality are now built over. Here grew in abundance *Prasophyllum odoratum, Diuris longifolia, D. sulphurea* (often large, with broad yellow petaloid sepals), *D. maculata, Caladenia Patersonii, C. dilatata, C. angustata, Chiloglottis Gunnii*, and many others. A very good friend, Mrs. George Perrin, herself a keen botanist, drove me out occasionally to other places of interest, and took me down to her summer cottage at Low Head, where Orchids were plentiful. A memorable fortnight's holiday was spent at Mount Barrow, where that fine Greenhood, *Pterostylis falcata*, grew in the bogs of the foothills, and where, for the first time, I saw the Tasmanian waratah in full bloom. The plateau of Mount Barrow, about 4,000 feet high, is a wilderness of huge rocks, interspersed with spongy "soaks" and masses of vegetation. Boronias, Euphrasias, the mountain *Bellendena*, the Richeas, and other flowering shrubs and herbs, make a gay picture; while the panorama from the summit is magnificent.

From Tasmania I returned to New South Wales, and spent the next eighteen months in a temporary appointment at Bullahdelah, 60 miles north of Newcastle. The outstanding phyical feature of Bullahdelah is its Alum Mountain, a rugged mass of alunite almost 1,000 feet high. At the foot of the mountain on its western side the township straggles along by the deep Myall River, which empties into the Myall Lakes twelve miles below. Ranges considerably higher than the Alum Mountain flank this picturesque valley, forest-clad. The timber resources of the district were once unsurpassed in the State, but that claim can no longer be made, though the milling industry is still in evidence. In the forests huge stumps of giant trees felled years ago may be seen, often carrying large clumps of *Cymbidium suave* on top. I collected nearly 90 species of Orchids about Bulladelah, where my companion on many excursions was the local medico, Dr. H. Leighton Kesteven, whose name is commemorated in *Dendrobium Kestevenii*, discovered on the Alum Mountain cliffs. Some of the finest specimens of *Sarcochilus divitiflorus* I have ever seen grew on the water-gums along the Myall River. Snow-white Calanthes were common in some of the brushes. Around Bungwahl, at the north end of the Myall Lakes, interest and admiration were often focussed on the splendid *Blandfordea flammea*, the largest of our "Christmas Bells." A mile further north was Smith's Lake. Smith is an excellent name, but scarcely does justice to this lovely sheet of water, set in the midst of a wild-flower paradise. Here I first met *Caladenia carnea* var. *gigantea*, with flowers so large that I thought I had discovered a rose-pink *Glossodia major* when I saw it. Here also grew the sombre-hued *Lymperanthus nigricans*, between masses of crimson *Correa speciosa*.

In many parts of the district, the King of the Greenhoods (*Pterostylis Baptistii*) was abundant; strangely enough, it had been reported extinct in some botanical circles, though it has been recorded in many areas since then from Queensland to Eastern Victoria. On the slopes of the Alum Mountain I made two interesting discoveries: (1) two specimens of the rare *Caladenia tutelata*, until then only recorded from a very few localities in South Australia and Victoria, and (2) Cunningham's *Corybas* (*Corysanthes*) *undulatus*, described in 1833 and then lost sight of and ignored for 91 years. It was fairly plentiful, and has since been recorded in South Queensland. But the most exciting discovery in the Orchid flora of Bulladelah came after my time, though it was my good fortune to have the first specimens sent to me for identification. I allude, of course, to the extraordinary subterranean Orchid, *Cryptanthemis Slateri*, excellent illustrations of which were published in this *Review* for June, 1938. A grant from the Australian and New Zealand Association for the Advancement of Science in 1932 enabled me, with the assistance of Dr. Kesteven, to describe this strange plant in fuller detail than had been possible from earlier specimens, but much still remains to be learnt.

Dendrobium teretifolium and its brush forest variety, *Fairfaxii*, were both abundant. I have seen plants hanging down nine feet from their supporting branch. The swamp oaks skirting the river below the township were festooned with the type form. Dr. Kesteven and I heard rumours of what we thought might be *D. falcorostrum* in the brushes upstream, so we had an expedition. The only plant bearing any resemblance to the Beech Orchid was a very juvenile one, apparently a seedling. I took it home and fostered it (through several removals) for thirteen years before it bloomed; and then it turned out to be *D. speciosum* var. *gracillimum*, which, in the meantime, had been discovered and named at Paterson.

Galeola cassythoides was common on the Alum Mountain, and at that time there were some very fine plants about 16 feet high. On the river flats *Diuris punctata* and *D. aurea* made a good display, as did *Thelymitra ixioidies*. The quaint little Hammer Orchid, *Spiculaea irritabilis*, was abundant. On the flats near the north end of the Myall Lakes, the paddocks were pink with myriads of *Spiranthes sinensis*, while on a sort of claypan formation at Topi Topi there grew the finest form of *Eriochilus cucullatus* I ever saw, with rose-pink flowers.

● Mr. R. L. Smith, Hon. Secretary, The Orchid Club of South Australia, writes:

"I am enclosing a photo of a wonderful collection of Black and Flory *Cypripedium* hybrids, grown by our President, Mr. F. De Rose, who is a past-master in their cultivation. These, last year, were a truly magnificent sight, and I do not think there could have been a better display anywhere in Australia.

"Mr. De Rose grows practically every type of Orchid in his numerous glasshouses, and at certain times of the year they are really a glorious sight to behold. He has about 1,000 *Cattleyas*, and approximately the same number of *Cypripediums*, to say nothing of *Vandas*, *Dendrobiums*, and almost every other type.

"During the last few years he has taken on the cultivation of *Cymbidiums*, but these, owing to lack of humidity and our dry atmosphere, are a very difficult proposition. He has about 300 fine plants, and this year they are really beginning to look as if they mean business. He should be rewarded by a large percentage of flower spikes soon.

"As President of the Orchid Club of South Australia, he is a wonderful help to all Orchid lovers, and nothing is too much trouble when it comes to helping growers of less experience. Visitors to this State can always be assured of a hearty welcome, and he is only too pleased to show his collection to anyone interested.

"The Orchid Club of South Australia has just recently suffered another severe loss in the death of its Vice-president, Mr. S. McGregor Reid. Since the war started, as business manager of the Department of Munitions in South Australia, he has not spared himself, and this resulted in ill-health, and eventually his untimely end. As a hobby, he took up the culture of Orchids, just before the outbreak of the war. He was very successful in growing *Cymbidiums* in this difficult climate, and flowered a big percentage every year."—15/1/1945.

Victorian Cultural Notes

R. BRUCE HOGG, *Brunswick, Vic.*

● We now come to July, August, September, by far the most gratifying for all Orchid growers. After nine months' hard work we now reach the main flowering period, we see plants gradually flower which have been cherished for months or years. Although we know the flowers well we still get the same pleasure from them. We will see back-bulbs and divisions either bought or exchanged, gradually develop, throw a flower spike which slowly flowers, much too slowly for most of us. We also see unflowered seedlings, some imported and some raised by ourselves from seed pods actually fertilised in our own houses. This should be the greatest thrill of all. I have three such seedlings with flower spikes, and they command my greatest attention. Yes, this is without doubt the season in which we get our reward for much hard work.

We are now at midwinter, and no shading of any Orchids should be necessary. While *Cymbidiums* and "Slippers" should be kept moist, but not wet, your *Cattleyas* and *Dendrobiums* should have been dried off and receive little or no moisture other than that gathered from a moist atmosphere. About the middle of this period most of your *Dendrobiums* will have developed their flower buds. When this has happened you can give them a little more water, but not an abundance.

Slugs and snails are always a danger during the flower period; look for them at night, and protect your flowers from them with a little dry cotton wool around the stem. While in bud be careful in the use of sprays for insect pests. It is really better not to spray Orchids while in bud, for a warm sun following spraying will often damage the flowers.

As soon as you have read this, start preparing your compost for potting *Cymbidiums* and "Slippers." Make this up from a mixture of leaf mould, tan bark, Todea fibre, coarse sand, a little charcoal, a little bone-meal, and add mountain soil according to your watering tendency. If you water freely, add very little, but if you are sparing with water, add a considerable quantity. The same applies if your house dries out quickly or slowly. The bulk of your potting mix should be leaf mould, tan bark, Todea fibre and soil. An equal part of each will serve; mix at once and leave it in the sun and rain to mature.

As your *Cymbidiums* finish flowering, try to harden them by reducing water and increasing air and light. It will be advantageous in the case of plants you propose to divide to sever them with a knife in July; this makes division easier and encourages additional growths. Divide a pot about a month after flowering. After potting, keep the pots close together, and give them an abundance of water on the foliage, but be sparing in watering the soil until the roots have recovered and are again moving.

Leave the potting of your "Slippers" until early October, but the knife may be used to prepare for ultimate potting and to encourage new growths to start. This could be done in July.

With your *Cattleyas* the only action which may be taken during the period under review would be the careful severing of the rhizome in anticipation of subsequent potting. Do not sever a weak plant, but strong plants could be severed to three or four bulb divisions, but only sever the rhizome and do not attempt to pot until after you have read the next issue of the *Australian Orchid Review*. The same applies to *Dendrobiums*.

I will close by advising Victorian growers that the Victorian Orchid Club is holding an Exhibition in the lower Melbourne Town Hall on September 4th, 5th and 6th. All Victorian growers should attend, for they will get an opportunity of seeing plants of most of Australia's most valuable Orchids in flower, and will be able, from the Exhibition, to judge the worthiness of their own plants, and also, by comparison, to see whether their cultural methods are correct. Also, I suggest that all Victorian growers should be members of the Victorian Orchid Club, for there they will learn much which is most difficult for me to express on paper,

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● Photographs of outstanding Orchid flowers suitable for the "Front Cover" illustration, or the "Frontispiece," are required for the Australian Orchid Review. Those of single flowers, or racemes with a few flowers, are preferable to thickly clustered ones, to show clearly the character of each flower. The Orchid Society of New South Wales will purchase any prints accepted by the Hon. Editor for reproduction in this "Review."

Dendrobium Bigibbum

R. S. DAVIS, Capt., U.S. Army

● It was an extremely fortunate occurrence that took me to Horn Island during the flowering season of *Dendrobium biggibum,* thereby providing me with the experience of observing a considerable number of this lovely Australian Orchid in its native haunt. This fine Orchid expresses itself fully in the agreeable environmental situation of Horn Island, through an extensive and luxuriant growth, and an abundance of flowers. The experience of observing such a colourful display was most gratifying.

Horn Island is one of a group located off the northern tip of Cape York, which includes Thursday Island, of pearl diving and inter-island trading fame. Located as it is in the tropical zone of intense summer storms and dry winters, the predominant vegetation is that which withstands the dry winter months, and therefore a growth that is somewhat open, and not that of the tropical rain-forest.

Arriving during the month of June, I was able to enjoy a portion of the pleasant winter season, for no rain had fallen during the previous month, and the days were quite dry and agreeable; cool early in the mornings and evenings, and warm throughout the day. The temperature, of course, was tempered by the proximity of the ocean, which also provided moisture necessary to sustain the native vegetation during the dry winter months. I was provided with the opportunity, one afternoon, of wandering through the "brush," along the beach, and among the coral reefs. This much-too-short expedition was through a section of the Island located to the south-east, at which cliffs and steep hills, from approximately 200 feet elevation, descended rapidly to the beach's edge. I was able to proceed from the centre of the Island to the beach through a break in the hills, and once there followed along the south coast approximately 200 yards to a point at which the cliffs came to the edge of the beach. The hills in this region were covered with a low type of chaparral or brush, and patches of rubble stone. Further along, the cliffs receded again, and a gully extended back from the beach approximately 100 yards. Tree growth is more extensive at this location, and at the mouth of the gully there are numerous mangroves.

While walking along the beach where the cliffs extended to the shoreline, I observed the lovely flowers of *Dendrobium biggibum,* which appeared in abundance along the face of the cliff. The plants at this location were in three-quarters sun, being exposed to direct light the entire morning and for two or three hours in the afternoon, as well as to the moist air and wind off the tropical ocean. Plants growing here were somewhat smaller than those in most collections in Queensland, but appeared very vigorous. The flowers likewise were smaller, but the colour developed from exposure to the sun was more intense, and of a deeper shade than those of the usual collection. The plants themselves developed and thrived in the humus produced from fallen twigs and leaves of the undergrowth which had lodged and collected in the crevices between the rubble. This arrangement provides the ideal situation of an adequate porous growing material with good drainage and a yearly replenishment of humus.

A further abundance of plants, with ten to fifteen blooms on a raceme, were encountered in the more shaded location of the gully, where a greater number of trees grew. The plants which grew in this area were very large, with well-developed pseudobulbs and leaves. Flowers were also large, in many cases more than two inches across, but because of the under-exposed position were of a paler hue than those which developed in the sunlight. However, the paler blooms possessed a very beautiful opalescence, which considerably added to their natural beauty. The plants invariably grow quite close to the ground on the trunks of a type of tea-tree, which possesses porous bark. In many cases the roots of the Dendrobe extend down into a loose accumulation of decomposed bark, mixed with the coarse sand prevalent in the area. The plants are large, producing many back-bulbs, and a considerable number of new growths each year.

It was later determined, through conversation with numerous persons stationed on Horn Island, that fine plants also grow at many other locations. However, time, unfortunately, did not permit a more extensive investigation. In any case, the examination made proved to me that the requirements of *Dendrobium biggibum* are correct drainage, adequate sunlight, wet summers, and a dry dormant period.

The enjoyment derived from the beautiful sight of a thousand or more blooms grouped along the cliffs added considerable impetus to my desire to successfully grow this beautiful Australian Orchid in domestication.

The Call of the Orchid

T. T. TAYLOR, *Macknade, Nth. Qld.*

The desire to collect Orchids and other plants in the forest and jungle for the purpose of cultivation and adornment is manifest in almost everybody. Children in particular are keen to gather wild flowers from the fields. This is an exalting characteristic of the human race. In many persons, of course, this trait is dormant, owing to the absence of facilities and opportunities. But immediately an opportunity presents itself the urge become irresistible, and if allowed full scope by unscrupulous people, vandalism is the result.

On the other hand, men and women who are of good judgment plan their Orchid collecting trips not for the purpose of material gain, but merely to ally in friendship their innate respect for other enthusiasts by exchanging or presenting plants and flowers, and there is promise of social unity and harmony in the delectable correspondence and friendship which the culture and exchange of Orchids promote. That being so, the particulars of an Orchid collecting trip are recorded herewith.

With perfect weather prevailing, we placed sufficient food and all necessary equipment into the car and departed hurriedly at midday one Saturday. Two hours later we arrived safely at a sugar-cane farmer's residence, where we were made welcome. This homestead, situated on the bank of a creek under the shadow of the coastal mountains, in a sylvan setting of scenic beauty, is an appropriate point of departure for an Orchid hunt. After greetings had been exchanged with the farmer and his family, no time was lost. We parked the car in an out-building, removed the boxes and pack-bags, strapped these on our shoulders, and, bidding our friends a cheery farewell, were gone into the wilds. We stepped along briskly, urged on by the pure air of the bush, the sweet scent of the gum trees, and the knowledge that the yokes of business and toil were cast aside for the time being, and we were free to roam the forest and jungle once again. The tall grass generally met with in the forest country of North Queensland had in our case been burnt some time previously, and consequently good progress was made.

We noticed many plants of *Cymbidium sauve* and *C. canalicalatum* perched high up on the bloodwood and gum trees, with long pendulous racemes of flowers oscillating in the breeze. These had evidently escaped the flames of the bush fires.

The gently rising ground over which we were travelling became steeper, and outcrops of small boulders were noticeable. Shortly after we entered the jungle by way of the creek, and were immediately shut in from the outside world. When approaching these outcrops it is wise to carry a thin flexible stick, and proceed slowly, scrutinising the ground ahead carefully, in case a death adder is lying in wait basking in the sun. These reptiles are perfectly camouflaged, and most difficult to see, and remain quite motionless until trodden upon; then beware, for the ensuing strike is swift and vicious. It is risky to venture into the vicinity of the foothills without a snake-bite outfit, carried where it is accessible for immediate use.

Upon entering the jungle, a halt was called to readjust the boxes and packs, and to tighten the straps, after which the strenuous and somewhat dangerous climb commenced. Great care and a thorough knowledge of bushcraft is necessary to successfully negotiate these rugged slopes. At this stage the Orchids encountered were of the common species, and far too numerous for inspection, except in the case of a conspicuous plant. On we toiled, our goal being the wild and precipitous gorges high up under the brow of the mountain, where human feet seldom tread, and where I imagine new varieties and possibly unnamed species will be discovered in the not too distant future.

Up and up we climbed, weaving in and out among the boulders, along ledges on the cliff's face, cutting through the vines, gaining height rapidly and perspiring freely. Then suddenly my mate, a few paces in advance, exclaimed, "Here we are, boys. Dump your packs!" We had discovered a cave, approximately fourteen hundred feet above sea level. We were assured, after a cursory investigation, that we would be safe and comfortable for the night in the cave. We collected a quantity of firewood, boiled the billy for tea, and devoured a hearty meal, and as the evening shadows closed in we entered the cave and sat upon a rough pallet of leaves and hessian. The events of the day were discussed—Orchids in particular.

Later, when the awesome stillness of a jungle night stole over the camp, we lay down to sleep. At this stage I considered it appropriate to entertain my friends with a little music, simply by snoring, in addition to the murmuring of the waterfall. I was rudely awakened, and rewarded for my efforts with a kick in the ribs. Apparently my talent was not appreciated, and the fact that bush etiquette allows boots to be retained as part of night attire rendered the kicks rather effective.

However, at dawn I prepared a billy of strong coffee to soothe my comrades' shattered nerves. We breakfasted at an early hour, but owing to poor visibility Orchid collecting was delayed until the sun was high above the horizon. In the meantime we examined the cave and its environments minutely, and were delighted with the result. Caves generally are dark, musty places, but in this instance it was not so. In fact, this cave is a wonderful piece of Nature's handiwork. Apparently a huge flat stone had been uplifted at some prehistoric time and deposited directly over a circular cavity of rock formation. Entrance is through an arched opening on to a level floor, with sufficient space for four or five persons to bed down comfortably. The cave is well ventilated, and, above all, thoroughly rain-proof, a necessary feature where rain squalls are frequent.

The roof is covered with bird-nest ferns. Upon the rocks, and in crevices nearby, Running and Tree *Adiantum* ferns grow in wild profusion. Suspended from trees on the opposite bank of the creek three large plants of *Phalaenopsis Rosenstromii* displayed their spikes of snow-white flowers, contrasting with the surrounding greenery. Thirty feet from the cave's entrance a miniature waterfall, with the usual deep pool below, supplies an abundance of crystal-clear water for all purposes.

A fine specimen of *D. teretifolium* drew our attention. This plant, in full flower, stood out in bold relief against a background of green vegetation, a picture of exquisite beauty. Further afield, *Dendrobium speciosum*, *D. undulatum*, *D. tetragonum*, *D. teretifolum*, *Cymbidium canaliculatum*, all in flower, created an atmosphere of attractiveness and enchantment. At 8 a.m. visibility was fair, although light mountain mists were rolling and drifting to the westward overhead. The period of daylight within the jungle is much shorter than that in forest country, and as light is a governing factor in Orchid culture, due consideration should be given this matter by growers who have in their collections Orchids taken from such places as these.

We decided to commence operations at once. Boxes and pack-bags were strapped on. Into these were placed hessian, cordage, knives, ammunition, etc., rifles and half-axes being carried by hand. The boxes referred to are made from plywood, being very light and strong. They are approximately two feet long by ten inches wide and nine inches deep, and are suspended lengthwise down the back by shoulder straps. By this means fragile plants such as *Phalaenopsis Rosenstromii* are carried without fear of damage. The stronger and larger plants are wrapped in hessian and tied securely. The ability to climb trees is an asset where Orchids are concerned, but where a tree is difficult to climb or cut down, the procedure is to cut a long, forked stick, and sharpen the prongs after the fashion of a wood-worker's chisel. With this implement the roots are prised off the tree, and by rotating the stick a firm grip of the plant is obtained, and lowering it to within easy reach is not a difficult matter.

In order to explore as much of the jungle as possible, our *modus operandi* is to advance three abreast, and where visibility is limited we follow the aboriginals' example of coo-eeing alternately. The reason, of course, is obvious. In the order mentioned we worked our way upward, following the general direction of the creek, forcing our way through the entanglements, peeping into crevices, glancing up at the impenetrable canopy of foliage, turning around occasionally to scrutinize the trees behind, in case a plant had escaped us, always on the alert for suitable specimens.

Presently we hear the call: "Nice plant here. Fetch the axe." In a short time we are all together again, discussing ways and means of taking this fine plant of *Phalaenopsis Rosenstromii*. The moss-covered trunk of the tree was much too slippery for climbing, so we decided to cut it down. Taking turn about with the axe, the arduous job of severing the trunk was at last accomplished. The plant was quickly extricated from among the broken branches, fortunately undamaged, and so another Orchid was rescued from the ravages of pests, and will now receive ample protection and suitable cultural treatment, in return for which it will give of its best by producing more and better flowers each succeeding year.

On this and later trips fertilized and ripened seed-pods of *Phalaenopsis Rosenstromii* were carried in cellophane wrappers. The seeds were dusted on to the bases and roots of plants of the same species, situated in suitable places for germination. This is an effort on our part to increase rather than deplete the numbers of plants in their natural habitat. In the latter part of the current year I shall attempt to preserve this species further by transplanting seedlings on to trees on one of the large islands off the Queensland coast. I have in mind a site where *D. tetragonum* is well represented, and as this species and *P. Rosenstromii* require similar conditions, success should crown my endeavours. The preliminary work in connection with this experiment is being attended to at the moment.

By midday on Sunday we were in possession of sufficient plants for our requirements. A diligent search was then made for the elusive *Anaectochilus* (Jewel Orchid), but up to the time of writing we have not discovered plants of this species. I am convinced that *Anoectochilus* is to be found in this locality.

We had now reached the limit of our outward journey, so decided to return. When making a detour large numbers of *Calanthe veratrifolia* were met with, growing in leaf mould in full shade, their tall spikes topped with clusters of lovely white flowers. At this elevation the creek is really a succession of deep pools and low waterfalls. These pools attract brush turkeys, pigeons, scrub hens, and other wild fowl to bathe and drink. The large blue and the larger green butterflies, darting above the pools with shafts of sunlight striking their brightly coloured wings, add beauty to these scenes of splendour.

Deep down in the clear water mountain trout swim leisurely around, and shrimps crawl in and out among the rocks. Here we tarried awhile to gaze in wonderment upon these impressive creations of Nature, forgetting, for the time, our Orchid hunt and the worries of these troublesome times. It became necessary to cross the creek at this point for various reasons, and we selected a rather difficult place. The youngest and most active of our party volunteered to attempt a crossing, and succeeded in reaching the opposite side safely. Our friend with the long legs followed, picking his way across carefully. When half way over he accidentally slid down the wet face of a moss-covered boulder, lost his balance, and flopped down into eighteen inches of water. From the cliffs came back the echo: "Have a drink, old boy!" accompanied by peals of laughter. He staggered to his feet unhurt, and eventually joined his mate on the opposite side. And together they stood, overjoyed with the expectation that I would find myself in a similar predicament. But disappointment was theirs, for I removed my boots and socks quickly, and was over in a twinkling, notwithstanding the fact that my friends made every effort to divert my attention from the work on hand. Overhead huge elkhorn, staghorn, ribbon and tassel ferns were noticeable.

We arrived at our enchanted cave safely. The muscles of our legs were beginning to feel the stress of stepping both up and down. Our trousers from the knees down were spattered with blood caused by leeches. Nevertheless, we were in good spirits, and, as usual, hungry. When my comrades had rifled the boxes and packs for food and devoured everything edible, I assumed command to prevent the Orchids disappearing in a like manner. Time was creeping on, so we collected all our goods and chattels, resuming our journey in Indian file. On one occasion the leader disturbed a nest of hornets, then jumped forward quickly, leaving his mates an easy target for these fiery little warriors—a typical bushman's joke indeed. Occasionally a giant tree decays about its base and topples over, leaving an opening through which the sun's rays strike the soil. The dormant seeds of dreaded stinging bush immediately germinate, and rapidly develop into large plants. The hair-like spines on the broad leaves cause intense pain if brushed by naked parts of the body, and for weeks afterwards, if water is applied to the affected parts, the pain returns instantly. Half a mile below the cave, in the latter part of the year, the waters of the creek disappear underground, and the boulders are comparatively small. We chose this as being the path of least resistance, but owing to a light shower of rain the rocks became slippery and dangerous, so we were compelled to leave the creek and travel at a higher level, through those terrible vines, one species of which is armoured with vicious thorns, one inch long, protruding in every direction. The "wait-a-whiles" also cause considerable annoyance by removing hats at every opportunity.

Eventually we discovered a miner's blazed trail bordering the jungle and running in the desired direction. The wild pigs were using this old trail for their migrations from feeding grounds to watering places. We emerged from the jungle at the foot of the mountain range, where our sugar-bags were filled with tree-fern butt and polypodium fibre. We crossed the creek on stepping stones and ere long were back at the homestead.

With our heavy packs removed, we rested our weary limbs. A pleasant half-hour's conversation and a cup of tea with the farmer and his family, followed by a drive home in the cool of the evening, ended our Orchid trip, the nett proceeds of which were a comprehensive collection of plants, ticks embedded in the neck, scrub itch all over the body, bruised shins, lacerated ankles, stiff limbs, and loss of blood by leeches.

An Appreciation

The Late George Cruickshank

E. USHER

By the death of George Cruickshank, the Orchid Society of New South Wales has lost a very fine and enthusiastic member. His interest in Orchids, which he started growing in Lismore thirty years ago, was extremely keen, and he was quite an authority on all known types growing in New South Wales. He was intensely wrapped up in *Cymbidiums*, with which he had marked success, being always unafraid to use the knife. One plant I have in mind that he separated into nine, all of which are making great growth.

Our old friend was known to all for his kindness of heart, and particularly to all the organisers of the various Orchid shows. G.C. was ever eager to give his time and energy, and would work indefatigably for just the honour, the glory, and his love of Orchids.

The attendance of members of the Orchid Society at the funeral bore a striking testimony to the esteem in which he was held.

Registration of a New Orchid Hybrid

NAME: *Cattleya* x *Agnes*.

PARENTAGE: *Cattleya Apex* x *Cattleya labiata*.

RAISER: E. L. Hayes.

DESCRIPTION: First flower opened April 13, 1945. Large, delicate mauve, labellum bright cyclamen purple bordered with pale mauve, throat lined with gold; perfumed. Raised by the nonsymbiotic method. L. Knudson's formula was used. Seed sown in tubes on sterilised media October 10, 1937. Grown throughout without artificial heat. Seed gathered about Easter, 1937, by N. F. S. Macdonald.

"*Proceedings of the Linnean Society of N.S.W.*," LXIX (1944).—This number contains "A Critical Revision of R. D. Fitzgerald's *Australian Orchids*," by the Rev. H. M. R. Rupp. Beginning with the remark that nothing can ever detract from the high merit of Fitzgerald's great work, he points out that in view of the limited facilities for reference, the difficulties of transporting material in those days, and other disadvantages under which Fitzgerald laboured, it was inevitable that occasional mistakes would be made in the interpretation of species. Moreover, since his day there have been many changes in nomenclature. In the review which follows, the author deals with his subject under the following headings:

(a) Necessary alterations in nomenclature;
(b) Erroneous interpretations of species; and
(c) Additional Notes and Comments.

Below will be found a list of the species now considered to have been erroneously interpreted by Fitzgerald, together with the name of the species which he actually figured in these plates.

Plant figured by Fitzgerald over the name.
Thelymitra canaliculata R. Br.
Microtis parviflora R. Br.
Prasophyllum australe R. Br.
Prasophyllum alpinum R. Br.
Prasophyllum nigricans R. Br.
Prasophyllum rufum R. Br.
Prasophyllum intricatum Stuart.
Drakaea elastica Lindl.
Calochilus campestris R. Br.
Caladenia clavigera A. Cunn.
Pterostylis Mitchellii Lindl.
Bulbophyllum lichenastrum F. Muell.

Species actually depicted.
A form of *T. media* R. Br.
M. oblonga Rogers.
An aberrant form of *P. flavum* R. Br.
P. gracile Rogers.
P. rufum R. Br. (hardly typical).
An unknown species.
P. Beauglebolei Nicholls.
D. Fitzgeraldii Schltr.
Pale-fl. form of *C. Robertsonii* Bth.
C. Fitzgeraldii Rupp.
P. pusilla Rogers.
Dendrobium variabile Nich. or *D. Aurantiaco-purpureum* Nich.

The Victorian Orchid Club will hold an exhibition of flowering Orchids at the Melbourne Town Hall (lower) on September 4, 5, and 6, 1945. All types of Orchids in flower at this time will be displayed, and Orchid lovers should not miss the opportunity to see this display. Leading growers have promised full support, and one of the finest accumulations of *Cymbidiums, Cattleyas, Cypripediums, Dendrobiums*, and other Orchids ever seen in this country should result. In Melbourne duplicates of most of the finest Orchids in Australia exist, and leading growers will show their plants of these magnificent varieties for the exhibition.

The exhibition will be non-competitive, and a large proportion of the profits will be donated to charity.

Phreatia crassiuscula, a new species described and skilfully illustrated by W. H. Nicholls in the *Victorian Naturalist*, Vol. 61, January, 1945. The type material is from Mount Bartle Frere, near Ingham, Queensland. Discovered by A. Glindeman.

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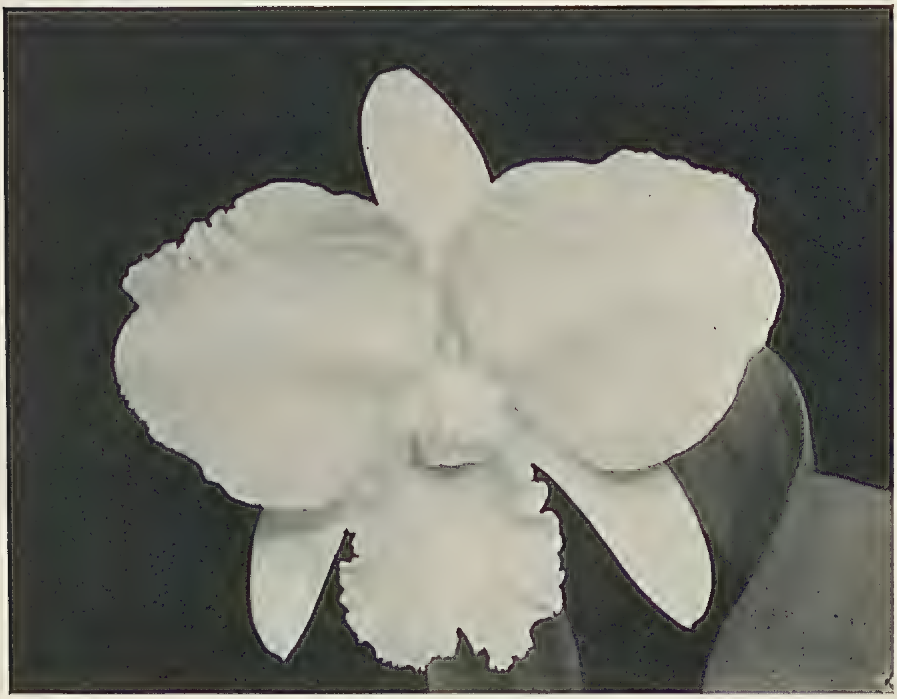

C. CELIA, *var. Rivermont*
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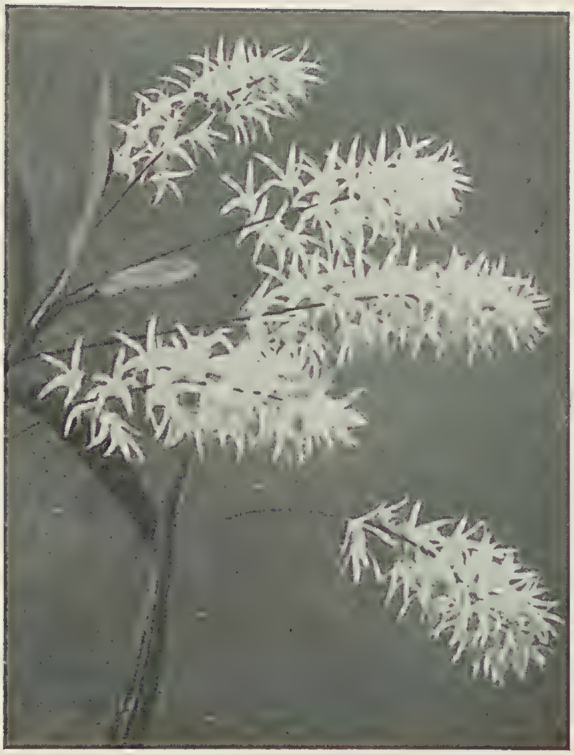

DENDROBIUM FUSIFORME, *Bail.*
Grown and photographed by Miss K. McIlrath, Murwillumbah, N.S.W.

● Mr. P. A. Gilbert, who has been editing *The Australian Orchid Review* since 1939, is resigning from the Honorary Editorship after this issue. Contributors are therefore requested to post editorial matter, MSS., or photographs to Mr. W. Worth, 4 Ward St., Willoughby, N.S.W., who will be taking over the Editorship with the September issue.

● ***Slugs.***—Owing to seasonable conditions many slugs are making their appearance, and eagerly devouring the roots of *Cattleyas* and other plants. Growers are reminded that metaldehyde (Meta fuel) mixed with bran in the proportions of 5 grammes of "Meta" to one quart of bran makes an efficient bait for these pests. The mixture should be placed in small lumps on the benches.—(Q.O.S. note).

● Back numbers of the *Australian Orchid Review* are still available, excepting seven issues, which are Vol. 1, Nos. 2 and 3; Vol. 2, No. 1; Vol. 3, No. 3; Vol. 4, Nos. 2 and 3; Vol. 7, No. 2. Copies of Vols. 1, 2, 3 and 4 are priced at 2/- each, Vols. 5 and 6, 1/9 each, and all subsequent issues 1/6 each.

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AUSTRALIAN ORCHID REVIEW

Volume 10 SEPTEMBER, 1945 No. 3

The author of each article is responsible for the facts and opinions expressed therein.

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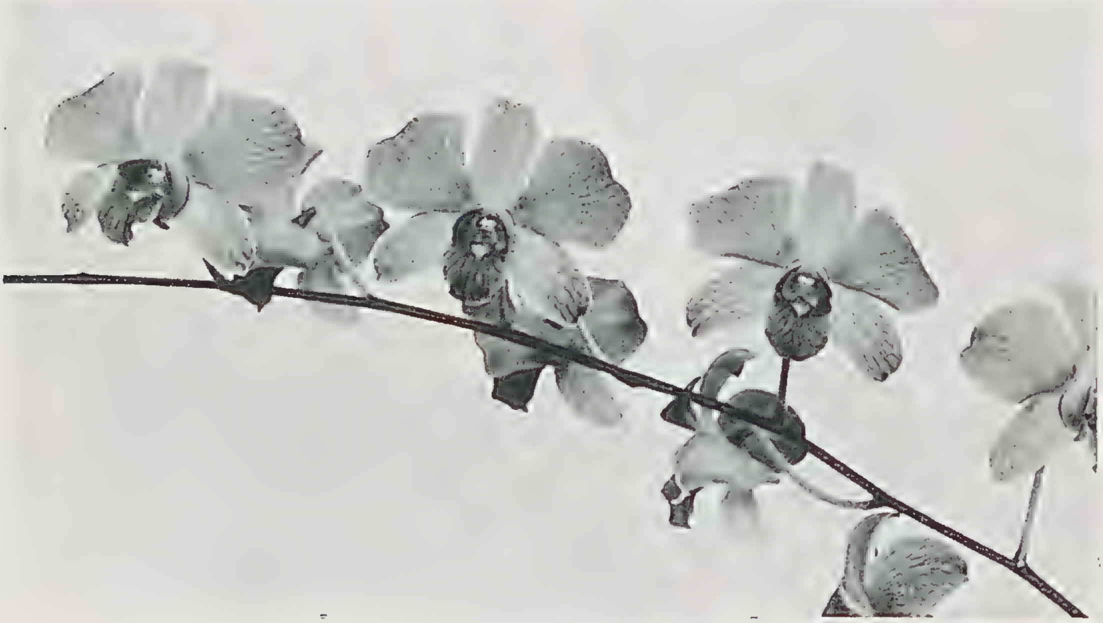
In order that the A.O.R. be fully representative of growers in differing climatic conditions of the Commonwealth, Orchid Societies in the States not represented above are invited to nominate a representative.

Regular N.S.W. Contributors:

Rev. H. M. R. Rupp—Australian Orchids.
T. H. James—Notes for Novices.
Dr. J. Vote—Answers Your Questions.
Wally Fahey—Cypripediums.
L. F. Hawley—Cattleyas.



DENDROBIUM BIGIBBUM-PHALAENOPSIS HYBRID.

Grown by Mr. McGregor Wills, Southport, and exhibited at the June Meeting of the Queensland Orchid Society. Photograph by Department of Agriculture & Stock, Brisbane. Mr. C. T. White, Government Botanist and Technical Adviser to the Queensland Orchid Society, states that "The plant may be described as a very robust one with flowers 2 inches across, dark purple, the veins more deeply coloured than the general tissue, the labellum with three very distinct white tubercular lines in the disk, the intermediate lobe minutely apiculate."

A Message to Readers of the Australian Orchid Review

● The retirement of Mr. P. A. Gilbert from the position of Honorary Editor of the *Australian Orchid Review*, which he has held since 1939, was briefly announced in June.

In considering his retirement, the feeling of regret at the prospect of losing his valuable services in that connection leads to the thought of what he has done for the *Review* and Orchid enthusiasts generally.

The objects of the Orchid Society of N.S.W. are mainly to promote and encourage the study and culture of Orchids and to preserve the indigenous species. The work of the Society on these lines has, I believe, stimulated a great and increasing interest in Orchid matters.

In a country like ours, where there are a very large number of species of native Orchids growing naturally under widely differing conditions of climate and environment spread over a very large area and often in isolated places, many people who are interested in the plants find difficulty in obtaining information regarding them, and so, when our *Orchid Review* was published, it met a very receptive field, as it offered a means of communication between Orchid lovers, and so has played an important part in the great development that has taken place in recent years, but of course required careful editing to be of real value.

Mr. Gilbert, who is very well known to members, has had a long association with the active work of the Society, having been a member of the Executive and Librarian since 1936. His literary ability and sound general knowledge of the indigenous species, as well as the culture of the imported Orchids, fitted him to direct the publication of the *Review*. His love for the Orchids is reflected in the comprehensive collection of plants grown at his home, which includes many indigenous species of interest not often seen in collections.

Many of our native plants do not take kindly to the conditions frequently met with in collections, and after a short period of unhappy existence gently fade away. Mr. Gilbert's well-established, healthy plants are an outstanding example of how they appreciate care and correct treatment.

The useful reference library which he has established has been very useful to him in dealing with the many problems that arise both in connection with the *Review* and the work of the Society generally.

The *Review* has been accepted and recognised by Orchidologists both in Australia and abroad, attaining quite a substantial circulation overseas before the war interruption came. Unintentionally, a useful guide to Orchid culture has been built up in the articles it contained, many of them giving the actual experience of members with various types of plants. This is illustrated by the fact that the back numbers are still in demand by subscribers anxious to complete their sets. The number of subscribers shows a consistent and steady increase.

The high standard carefully built into the *Review* by Messrs. G. H. Slade, Ron Stewart, and T. H. James, who were largely responsible for its early production (Mr. Slade was the first Editor), has been maintained by Mr. Gilbert through the difficult period when war conditions were responsible for restrictions on colour plates, illustrations, quantity and quality of paper, etc. I am very appreciative of the amount of work done by the men who have filled the various executive positions of the Society during the recent troublesome years. The positions are, of course, purely honorary, and make demands on time which can often be ill spared, and so Mr. Gilbert has found that owing to increasing demands on his time he is unable to carry on the work of the *Review*.

We all appreciate the valuable work done by him, and hope that his association with Orchid enthusiasts will continue to be a long and happy one.

Messrs. Shepherd and Newman Pty. Ltd., who have always been associated with us in the production of the A.O.R., and, as the printers, have been in close touch with Mr. Gilbert, wish me to express their appreciation of the consistent and efficient service given by him, which has been of the greatest assistance in maintaining the standard of the journal, especially during the war period.

E. A. HAMILTON, President,
Orchid Society of N.S.W.

6th July, 1945.

Victorian Cultural Notes

R. BRUCE HOGG, *Brunswick, Vic.*

Once again, from a cultural point of view, we reach the most important season of the year, that is, the period in which, your plants having finished flowering, will be divided and generally rehabilitated.

The first thing to have ready with the approach of this season is a sufficient stock of potting material for the various classes of Orchids. I dealt with this in Cultural Notes in the June issue, and if you have not already prepared your potting mixture you should take immediate steps to do so.

Cymbidiums.—I would suggest that you handle your Cymbidiums first, followed by your Slippers, and do the Cattleyas as they indicate to you that they are ready for potting. While I honestly believe that Cymbidiums do well with potting and division, each year Slippers and Cattleyas should only be potted when you feel that the require it. In the June Notes I suggested that with your Slippers and Cymbidiums the knife should have ben used to make division easier when repotting.

Use only clean pots with a liberal supply of crock in the bottom for all Orchids, but Cymbidiums like a considerable depth of soil, and in consequence, you would use less crock for them than for other varieties. Knock your plant out of the old pot, carefully shake the soil away, doing as little damage as possible to the roots. Then pull away all dead leaves, flower stems, etc., and carefully trim off the dead roots, shorten the live roots to five or six inches, and proceed to pot your plant.

Have a considerable quantity of soil in the pot, conical shaped at the top. Place the plant on this cone, with the roots running outwards and downwards. Put in more soil and press firmly with the fingers and bump the pot several times on a solid bench to fill any voids. Keep adding soil until the plant is firmly embedded in the mixture with the soil about half an inch from the top of the pot. Water immediately after potting, and place your pots close together in the warmest part of your glasshouse. If you have bottom heat, they should have the first month with its assistance. If you have not bottom heat, by stacking the pots touching each other, keeping the plants shaded, and using relatively little water, they should not suffer severely by repotting.

I previously expressed the opinion that Cymbidiums do best with an annual division and repotting. I have rarely seen a large Cymbidium which has been in its pot for some years divide into small plants without suffering very severely from the change, and if your plants are not too soft they will benefit by annual division, and throw more growths than is the case with large specimen plants. This also gives you an opportunity to build up stocks of plants for the purpose of exchange to improve your collection.

Cypripediums.—I said previously that this species does not like frequent repotting. Do not touch your plant unless you feel that it requires repotting. If it does, endeavour to repot with as little interefrence to the root system as possible, but the bulk of the old soil should be shaken away from the roots. I think Slippers do better potted on into larger pots than by being frequently divided, and I would suggest that you only divide a Slipper if it is too large to persevere with as a specimen plant, or if you require a division for some special purpose. The potting mixture for Slippers is much the same as that for Cymbidiums, but they will not take the amount of manure in the soil as Cymbidiums. After potting, greater care must be taken to keep them properly shaded until their roots have again started working, and also great care should be taken to see that the soil never becomes wet.

Cattleyas.—With these Orchids there is an inclination to-day to use less and less sphagnum moss and to get closer to pure fibre. Also the tendency is to interfere with the forward root system as little as possible. The time to pot your plant is when the new root nodules show up on the base of the last growth or the new growth. Knock it out of the pot carefully, remove decayed fibre from the rear of the rhizome, but if the fibre in which the live roots are embedded is at all sound, do not disturb them, and put this fibre into the new pot with the plant. There is no occasion to wash your Todea fibre, nor is there any occasion for extensive teasing. Just pull the Todea fibre off in handsful and pot firmly, with the live roots running outwards and downwards, and with the back of the rhizome touching the side of the pot. After potting, Cattleyas would be better to be shaded, but also they would recover from the potting most quickly if you hang them suspended from the roof, and give them practically no moisture on the soil but keep your house damp at all times.

If your plants, prior to repotting, show signs that they are not happy, or that they have not been happy, endeavour to think out the reason and correct it. The only advice in this connection would be trial and error. It may be that you had too much soil and not enough fibre in your potting mix. It may be the reverse. It may be that your potting mix was too rich or too hungry. It may be that the atmospheric conditions in your house are not correct. It may be that too much sunlight has been admitted without compensating the loss of atmospheric moisture to cope with the heat generated by the sun.

You may have signs of black spot in your Cymbidiums. If so, make a fresh start with a forward bulb or two and discard the rest. If there are any signs of scale or thrip on your plants, dip them in a mixture of "Volk"—one part to forty parts of water, to which you will add "Pestoxol" in the proportion of about one part to sixty parts. I do not dip prior to potting, but wait for about eight weeks until these plants are established in their new pots. I then carry out every plant, dip in the above mixture, wash the pot, and put it back in the house.

Dirty benches and a dirty house are likely to promote disease. At least once a year every plant should be taken out of your house, and you should then take the opportunity to thoroughly cleanse it and spray it with some spray such as the new D.D.T. to kill as many of the living organisms as possible.

Another summer approaches. The putty on your glasshouse should be covered with a coat of fresh oil paint to protect it from the sun, and the woodwork on the inside of your glasshouse should be painted white to freshen it; but for the first few days after having painted the interior you would be wise to leave all doors open unless you can keep your plants elsewhere until the smell of new paint has gone.

Blinds.—If you use hessian blinds for shading, as summer approaches and the days warm up you reach the time when the old torn hessian should be replaced with new.

In these notes I deliberately avoid giving cultural lessons for other than the main species, but should readers wish to have information dealing with these I will endeavour to obtain that information and publish it for them.

● ***Orchid Shows.***—Secretaries are invited to forward short reports of charity, trade or local shows for publication in the A.O.R.

Vandalism

● In your latest issue is an article which contains the following: "Presently we hear the call, 'Nice plant here. Fetch the axe.' In a short time we are all together again, discussing ways and means if taking this fine plant of *Phalaenopsis Rosenstromii*. The moss-covered trunk of the tree was much too slippery for climbing, so we decided to cut it down. Taking turn about with the axe, the arduous task of severing the trunk was at last accomplished," etc., etc.

I wonder how many real nature lovers were jarred by what appears to be terrible vandalism.

Would it be asking too much to insist, in the *Australian Orchid Review*, on the desirability of preserving our heritage of bushland for posterity where possible, and avoiding such needless exhibitions of vandalism that we sometimes witness?

By so doing you will assist all the Natural History Clubs and the State authorities in preserving respect for the various State laws aimed at the protection of our flora and fauna.

In Queensland, at least, it is an offence to collect Orchids of any kind.

Of course it is understood no objection is ordinarily taken to the collection of Orchids for certain special and scientific purposes, but no one is justified in seeking Orchids by felling trees and destroying perhaps dozens of small seedling plants.

(Dr.) H. FLECKER.

The above letter registers an appeal that is often heard among nature lovers in this State also. No doubt a great deal of vandalism is due to thoughtlessness. Dr. Flecker's letter will make thoughtful people pause before denying other people pleasure by taking or destroying plants in quantity that can never be replaced.

Unfortunately, the bushlands are denuded mostly by those who are not particularly interested in plant life, and who will not read his appeal.

In the particular instance it should be noted that some effort was made to "increase rather than deplete the number of plants in their natural habitat."—ED.

● ***Acknowledgment.***—We have received from Mr. J. Wyer, Hon. Secretary of the North Queensland Naturalists' Club at Cairns, a copy of the "Check List of North Queensland Orchids" published by the Club. This little booklet of 7 pages, which may be had from the Hon. Secretary for 1/-, is very welcome to botanical workers among Australian Orchids, and should be of interest to the Orchid public. About 134 species are included, and the localities given.

Our Cypripedium Exhibition

Being the Impressions of a Novice

RICHARD DART, *Waverley, N.S.W.*

● The writer is very fond of music, and goes for the best classical stuff; but, strange to say, he is not a musician, and cannot even read music. At the same time he is much inclined to telling musicians what he thinks of their efforts. They merely smile indulgently at him with a very superior air. So here goes for the little brown chaps. (Incidentally, "the little brown chaps" are no longer brown.) In the last few years "Slippers" have changed their khaki for robes of white and pink, green and yellow, with lovely stripes and beautiful spots.

With the assurance of one who knows nothing about his subject, the writer proposes to give you some impressions of a "Slipper" evening.

Entering the hall, he decides to stand facing the door, to see which way the people go: do they turn to the left or go straight on? He is interrupted, "Hullo, old chap, what are you doing, counting the people?"

"No, I'm thinking."

"Why be so serious about your thinking? Have you committed a murder, or souvenired a tram, or perhaps a 'Slipper'? Your pocket looks bulky."

"Well, if you must know, I want to get people's impressions, so you had better come along with me. While I was standing here so guilelessly I have been watching my opportunity to grab someone, and you are the one to show me around and tell me something about these plants."

He is marched off without a struggle. But, alas, just as I was beginning to get his thoughts two charming young ladies hove in sight, made straight for us, and marched him off. Resigned to his fate, he murmured something about being rescued. So I was left to my own contemplation about our little friends.

It is not only in colour that Cypripediums have improved so much, but texture, shape, and size—as fat and podgy as any porker. They stand up as straight and with their shoulders as well back as a soldier—monarchs of all they survey. Did I say monarchs? Yes, the grandest of them all was there, "The Grand Monarch," pride of Wally's heart. It is certainly beyond description by a novice.

A "Slipper" evening not only consists of looking at flowers and selecting plants you intend to own, if possible, or at least get a back-cut of them; but there is the friendliness of everybody—their graciousness to you, and the information you get from the experts as they guide you around the exhibits.

Just as these thoughts are going through my mind a friend of brief acquaintance hails me and introduces his wife. The opportunity is grasped. I inquire amiably if he would mind my taking his wife on a tour of inspection. He innocently consents, but hastens to follow, and smiles benevolently when *his* company is objected to. My notebook is taken out, and the entry is made: Woman No. 1.

The position is explained to the lady: All the articles that we read on Orchids, all the talks and lectures that are given, are by men. As women wear the Orchids and are keener judges of colour and beauty and also deeper thinkers, their opinion is highly important. I am of the opinion that she agrees with most of this, and so the tour is on.

Her attention is not drawn to any plant, either directly or indirectly. We are standing near Mr. Reg. Richards' exhibit. After a careful survey of several minutes she selects *C. Festivity* x *Wargrave* as the one that appeals to her most (this novice thinks it a wise selection). The other exhibits were visited in turn:—

W. Fahey:	Her first choice, *Festivity* x *Wargrave.* Second choice, *Number O.*
W. Worth:	*Cheddington.* *Our Prince* x *Euryostum*, var. *Palatine.*
L. Sasso:	*Audrey King.* *Olivette.*
W. Palmer:	*Chrysostum* x *Elizabeth Hiam.* *Aurensis.*
C. Cambourn:	*Upton Gem.* Unnamed, with three flowers.
D. Hemmings:	*Grace Darling.* *Nirma Formosa.*
E. F. Wilks:	*Cameo.* *Bernadette.*

None of the selections was hurried. Sometimes we paused for several minutes before selecting those which were most satisfying to her aesthetic taste.

Now for the Cymbidiums:—

Helen is selected as No. 1, and Mr. McDonald's *Grand Monarch* No. 2. At this stage, you ask, did she not like *Charm*? She replies that it did not appeal to her as much as two or three others. The writer's own opinion was that it was easily the best. It might be noted that her choice was for two greens, and that she is not the only woman who prefers green to any other.

Just at this moment our lady friend disappeared. Whether it was my fault or her husband's I don't know, but I am sure that I forgot to thank her for the information that numerous growers have received about their plants *from one who has to wear them.*

Looking about for more information I am waylaid by a gentleman and his wife who are seeking the same thing (information) about compost. It is soon ascertained that they have had a liberal dose of it (information, not compost) already, but they insist that my opinion is needful and absolutely necessary, so the prescription is given (but not in Latin).

My generosity is rewarded, for Women No. 2 doesn't have to be found; she presents herself to me. She wants to know everything about every plant in the exhibition, and she wants it all at once. She is an artist, and beseeches me to satisfy her craving to know more about the beautiful plants. The opportunity is once again seized. I inform her that, being a woman, she knows more about beauty than I do, and would she be good enough to write down the names of the two Cypripediums she likes best, and the two Cymbidiums.

The time is getting late, and we have made no progress with our notes on the exhibits. Seelng Walter Fahey, and knowing him for a "slipper" expert, we decide to make use of him.

"Wally, how about making a few short notes?"

After demurring, he consents, and in a quarter of an hour he puts the notebook we had given him back in our hands.

WALTER'S NOTES:

Mrs. Grace Mitchell.—Two Cymbids. *Lucy*, early, white, flushed. *Alexalban*, nice pink.

R. Dart.—*Cym. Helen.* Fine dark greenish flower, rather an unusual colour; a very desirable plant.

R. Richards.—Only in the kindergarten stage (so Reg. says), but he has certainly done well in two years. A fine display. *Festivity* x *Wargrave* the best.

L. Sasso.—Deserves credit for the very fine display of miscellaneous Orchids. Best Cyp., perhaps, was a nice green *Anita compacta.*

C. Cambourne.—A mixed lot. Nice *Cym. Lucy.* A tint of green in this flower. Cym. *Collinette* nice colour.

W. Palmer.—Fine display of Cyps., and a fine Laelia Cattleya, *Argus.* Beautiful lip. A fine Cyp. in Mildred Hunter.

E. F. Wilks.—Four very nice Cyps., perhaps the best *Cameo.* Fine variety.

A. Begg.—*Cym. Atlantes.* Fine substance and shape. Early.

J. Bisset.—Nice display of good-shaped Cyps. Perhaps the best was *Golden Moon.*

Just about this time Mr. Les. Hawley happened along. "Which do you think are the best two slippers in the exhibit, Les.?"

"I don't know about the best two, but I know which is the best one—*Grand Monarch.* I don't think you can fault lt. It is undoubtedly the best we have ever seen here. These are several good ones that could fill second place."

John Bisset being on the skyline, and, for a wonder, disengaged, he was approached with the same query as regards the two best Cyps. "*Grand Monarch* undoubtedly No. 1. As for second, well, let us have a look around." After a careful inspection *Festivity x Wargrave*, in R. Richards' group, was selected to be as good as any.

"What about the Cymbidiums, Jack?"

"*Charm* No. 1; I think *Atlantes* second best."

A FEW NOTES BY THE WRITER.

N. McDonald. — Cyms. *Grand Monarch*, lovely large soft green, with a nicely spotted lip; *Janine* (*Schlegelii* x *Albania*), lovely rich pink, one of the richest colours I have seen.

A. R. Begg.—*Cym. Atlantes* (*erythrostylum* x *Alexanderii*), nine flowers. Beautiful clear white, broad sepals and petals, medium broad lip, marked with carmine the whole way round to the column. Very fine early flower.

P. L. Meech.—Seven "Slippers," including *Grace Darling*, a nice yellow variety; *Cym. Euterpe; Cym. Lucy*, 18 large white flowers, flush pink, good variety; *Westonbirt*, texture and fine shape.

W. Worth.—*Cattleya Loddigesii*, eight flowers, nice mauve pink. Ten "Slippers," including *Olivette*, a nice green variety, unusual colour. Also, perhaps the best, *Our Prince* x *Euryostum* and *Josette* x *Grace Darling*, two large flowers back to back; *Padre*, and *Armistice.*

F. M. Slattery.—*Den. Superbiens, Laelia Anceps*, Black and Flory Slipper (large). *Cym. Astra.*

L. Sasso.—Sixteen Slippers, *Cym. Alexanderii* x *Gattonense* Lycaste, *Skinneri.* Calanthe, *Veit-*

The Black Spot or Mosaic in Cymbidiums

JOHN BISSETT, *Abbotsford, N.S.W.*

● One of the most important questions and one of the most debatable subjects in Orchid culture is "What is the black spot or mosaic in Cymbidiums, and can it be cured?"

The opinions expressed here are those of the writer, and are given to assist Orchid growers to eliminate the trouble as much as possible.

First of all, the real black spot is incurable if the new growth on a Cymbidium begins to show white or black markings. As soon as this is noticed, the plant should be burnt at once. I would like to state now that I do not wish to unduly alarm growers. My sole aim is to eradicate all plants everywhere that have the disease, and to stop the selling of plants which are affected to unsuspecting buyers and new enthusiasts. Many plants in all of our collections have black marks on the leaves and bulbs, but in most cases these are cultural or caused by sun burns, etc. As stated before, the incurable black spot can only be definitely defined when it appears in the new growth when it is but a few inches high.

Many growers claim to have cured black spot on plants, but I would say that these plants did not have the real thing; once a new growth appears on any back-bulb or plant, and shows signs of white, yellow or black fleckings, it is impossible to cure it.

I liken the black spot disease to a germ which can attack any Cymbidium, and when a plant has been potted in a bad mixture or grown under adverse conditions it is very liable to contract the disease. I definitely believe that the disease is not transferable from one plant to another, and where I have seen a number of plants affected in a collection they have all been grown under the same conditions, and even here, plants may be found without any trace of it, proving that some are more susceptible to it than others.

Manure and artificial feeding are two of the worst factors in aggravating and, perhaps, causing the disease.

Often a plant will continue to grow, and even flower, when badly diseased, but nothing can spoil the look of a batch of Cymbidiums more than a few diseased plants in their midst.

Quite a number of collectors have isolated a few plants with disease, and many new enthusiasts are always hoping to cure plants affected, but when noted growers such as L. Hawley, W. Fahey, P. A. Gilbert, C. Hildebrandt, D. Adamson and Dr. Kirkland, and leading Melbourne growers, including B. Hodgins, W. Wright, and B. Hogg, say that the real disease is incurable, I think that all such plants should be destroyed, and let us concentrate on growing under ideal conditions and in good open mixtures.

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chii. Brasso-Cattleya, *Dion. C. Furness.* The "Slippers" included *Joyce Winifred, F. M. Ogilvie* x *Westminster. Anita Compactum* was a lovely green variety. *Saccolabium giganteum.*

W. Fahey.—*Cyp. Grand Monarch,* F.C.C. This plant has just recently had its honours awarded by the Judging Committee, and stood head and shoulders above the rest. *Festivity* x *Wargrave,* very nice flower, beautiful colour, autumn tones. *Fulminster,* two flowers, small but good.

W. Brierley.—Four nice Cyps. *Sel. Sedenii. Cym. Ceres.* This plant seems very like a *Lucy* which flowers at this time. *Ceres* is a late flower.

C. Cambourn.—Four Cypripediums and two Cymbidiums. Best "Slipper" *Upton Gem.*

J. Bisset.—*Cym. Carisbrook* (*Ceres* x *Ralph Sander*). Two spikes, one with 22 flowers, the other 18. Very well-grown plant. Broad sepals and petals, white lip and bright red band. "Slippers" included *Hughenden* and *Gwen Octarus.*

L. Hawley.—*Cym. Charm* var. *Elegans.* A delightful spike of this most popular of Cymbids. Well-grown plant, 15 flowers. It was later in the evening recommended for an award by the Judging Committee.

We were introduced by friend Slattery to a man who had never seen an Orchid before. He was asked to select the Cyp. and Cymbid. that he liked best. Half an hour later we received our little bit of paper (but alas, the pride of Walter's heart was not on it); instead he had written *Our Prince* x *Euryostum Palatine*: this worthy Cypripedium is the property of our new Editor, who I trust had not waylaid him and used a big dose of moral persuasion. His Cymbidium choice was Mr. Brierley's *Ceres.*

● Short articles and photographs of rare, interesting and exceptional plants are required. Payment will be made for photos published in the *Australian Orchid Review.*

The Importance of pH in Composts

R. BRUCE HOGG, *Brunswick, Vic.*

● While in Adelaide recently I visited one or two collections, and I am sure the owners will excuse me for saying that they are not doing well, for in making this statement I am helping them, and perhaps many other growers who are not getting the result they would like.

The collection of Cymbidiums I am going to speak of is quite a large one, all grown under glass, with few exceptions very small bulbs, and in many cases a number of weak growths which had barely made into bulbs. Careful investigation indicated that there was insufficient rain water, and that overhead spraying left what appeared to be an alkaline deposit on the leaves.

Adelaide possesses a number of enthusiastic growers, and a club with over fifty members. These deserve our assistance, and we should help them to succeed. I will not accept that the climate will not grow Orchids. Given glass and applied heat, they should succeed just as we do in Melbourne. Unfortunately they are isolated from Sydney and Melbourne, and cannot collect that vital information which all successful growers collect by personal contact.

Before developing the main purpose of this article, I would like to advise Adelaide growers to emulate Melbourne methods rather than those of Sydney. The Adelaide climate (for Orchids) is very similar to Melbourne, with the exception of a slightly warmer winter, but too cold to do away with glass and heat, and a hotter summer which is far too low in humidity for outside growth.

The grower of whom I speak selected two typical plants for me to examine. One had been potted two years in the compost he then used; the other was potted in a new mixture he used last year. Every plant potted two years ago had made many weak growths, but appeared to sadly lack vitality, while those potted last season looked much better, just as though they were recovering from a lean period.

I knocked each plant out of the pot, and found that while the one potted two years ago had not made any root growth whatever, the old roots cut back for potting were just as when they were potted, and not a new root had developed. The plant potted last season in what was called the new mixture had quite a vigorous root system, and was recovering. This grower, following my advice in the *Review*, has prepared a large heap of compost for the coming season to allow it to mellow. I took a sample of soil from the base of the old mixture, that used last season, and that prepared for this year. These I brought to Melbourne and tested for their pH value, and found them respectively to be 6.9, 5.7, and 6.5, and this tells us volumes.

Orchids must have acid soil; 6.9 is practically neutral, 6.5 barely acid, while 5.7 is acid. The pot planted two years ago with no root growth was 6.9, and I predict that no matter how long the plant were left in the pot it would not make root, for a plant will not send roots into soil harmful to it. It had made many new growths, which lived on the reserve stored in the old bulbs. The mixture last year was much better, and being acid, the plant developed a strong root system, and ultimately would have thrived; but how tricky is the preparation of composts when this year's (subject only to neutral rain), supposed to be the same as last year's, had a pH of 6.5 instead of 5.7. This 6.5 would probably have developed to 6.9 or 7.0 under the influence of alkalinity of town water.

However, spikes were conspicuous in their absence, and those that were there were so weak that the owner might be tempted to cull good Orchids, for a weak plant will never give the flower which the plant is capable of producing.

I can fairly safely eliminate the town water from my theories, for the plant with an acid value of 5.7 had had much town water over a period of nearly a year. I think the explanation is in the compost itself, and strongly advise Adelaide growers to get their compost tested for pH before starting this year's potting, and I advise the grower referred to above to condemn the mixture prepared for this season and repot every plant in the old mixture. If suitable soils cannot be obtained in Adelaide, see if you cannot arrange to have a suitable mixture railed from Melbourne. I would suggest to them—two parts tan bark, one part leaf mould, one part fibrous loam, to which I would add a little very old cow manure, some charcoal, and some very coarse sand (nearly gravel), adding one part chopped todea fibre if you have it.

Should anyone wish to test the pH value of a large quantity of potting mix, turn the mix over three or four times and take a handful from each of several different parts of the heap. Mix these several handsful together thoroughly, and fill a cigarette tin with that mix. This will ensure that a fair average pH of the whole heap will be obtained.

Cypripediums

WALLY FAHEY, *Waverton, N.S.W.*

● By the time this issue goes to press these charming Orchids will have almost finished flowering, with a few of the late ones only to flower, so it is very important to attend to your repotting, as from September on is the best growing season.

Make sure that every plant is potted correctly, and do not fail to repot a plant that is not just right. I am sure you will be rewarded for your little extra trouble when the next flowering season comes.

Make sure your plants are clean, examine underneath the leaves and see they are free from Scale and Thrip. I strongly advise growers to give their plants a good clean-up this month, as there is no doubt this is the time that Mr. Thrip is looking for a good home to spend the summer. So clean the plants with a brush and some soapy mixture, then wash off and spray well with some insecticide.

When repotting, see that the drainage is right; make the hole in the pot a little larger and crock up to about two inches before putting in some compost. Pot your plants high. I suggest you have the rhizome of the plant about half an inch above the top of the pot. Do not ram the compost too tightly, just firm; it gives better drainage and lets the roots have a bit of breathing space. The compost, well, there are many mixtures used for Cypripediums, and one cannot say one is better than the other—it all depends on the treatment you give them. For instance, tan bark will need more water than fibre, and plants dry out quicker in the unheated house than they do under heated conditions, so the watering wlil have to be controlled by your own conditions of growing. Cypripediums should never be allowed to become dry, as they have no resting period and are growing all the time. I use a mixture of about 75 per cent. brown fibre and 25 per cent. new tan bark, and the plants seem to be very happy about it.

Cypripediums thrive on fresh air and plenty of water during the summer months. I usually have the door open on the hot days and keep the floors well damped. Now that the winter has passed you can increase the watering and give more ventilation. Watering overhead in the summer will do no harm to the plants if the ventilation is right.

The best time to repot is two or three weeks after the flowers have ben cut, but of course repotting can be done almost any time, it does not seem to affect them any; but if you have a lot of plants and you repot after flowering you will not have so much work to do when the Cymbidium time comes along.

Give your Cypripediums a fair go, as I do not know of any other Orchids that will reward you so much as these charming plants. They flower in a period when flowers are scarce, and with a few of the summer flowering varieties in your collection you can have flowers all the year round, and when you consider the flowers last eight to twelve weeks, surely they are worth your consideration.

I will conclude by suggesting to those growers who have not yet taken to Cypripediums to try a few of the highly coloured hybrids. I am sure you will get keen on them.

ORCHID SOCIETY OF N.S.W.

Annual Exhibition

will be held on

12th, 13th, 14th, SEPT., 1945

9.30 a.m. to 5.30 p.m.

at

Beard Watson's Showrooms

359 GEORGE STREET, SYDNEY

The great development in Orchid culture and the many imported hybrids flowering for the first time will ensure Interstate and Country visitors seeing plants on show surpassing those of pre-war years.

Local enthusiasts are looking eagerly forward to the Exhibition.

● *Extract from letter received from Dr. H. Flecker, Cairns, North Queensland.*—I have been impressed with the idea adopted by some growers here of planting many of our epiphytes on low shrubs such as *Camellea thea* (tea plant) and *Codiadum variegatum* var. *pictum* (here called croton), producing a beautiful and pleasing effect, especially with *Dendrobium Phalaenopsis.*

This is well worth recording in the A.O.R.

Here they are now grown outside in the garden.

Hitherto they have been planted high up under mango trees, in forks of other trees, and on the Archontophoenix Alexandrae Palm, often too high to see the individual blooms.

When Should Orchids be Severed?

R. BRUCE HOGG, *Brunswick, Vic.*

● This is a subject on which opinion conflicts as much as that of composts, but it is one of the most important and certainly the most remunerative if done scientifically, while it shows a dead loss if done injudiciously.

It is my opinion that the grower who allows old Cymbidium bulbs to degenerate into back bulbs, old Cypripedium growths to die a natural death, and who has Cattleya plants of seven or eight bulbs with only one lead, is not a good grower. Orchids are much too valuable to allow their natural increment to pass into decay, and every grower should be constantly watching his plants to select the psychological moment in which to use the knife.

At this point I should qualify my statements. A plant which is not robust and growing vigorously should not be touched, and I have seen many plants set back years by the tactless use of the knife, and while much waste can take place by not using the knife, on the contrary great damage can be done by being too greedy.

There will always be times when a plant will go back after severing even in the hands of the most skilful grower. When this happens the only way to repair the damage is to knock the plant out of the pot, shake away the soil, cut off all the damaged roots, and plunge the plant on bottom heat to encourage it to develop a fresh root system.

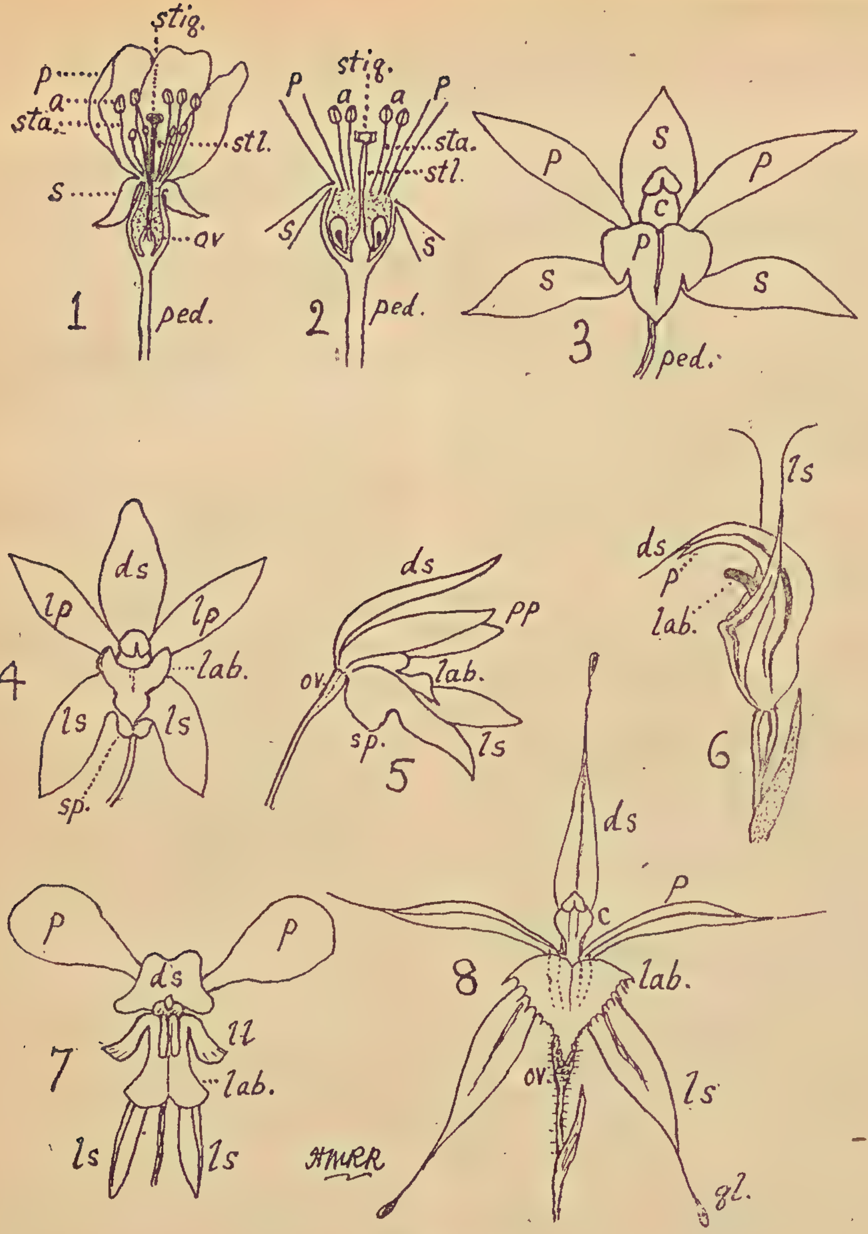
It has been argued that bulbous plants such as Cymbidiums and Cattleyas use their back bulbs as a reserve supply of food. There is little doubt that this is true, but I feel that it has little application to Orchids grown under artificial conditions, where one has control of temperature and water. Were we to neglect our plants, however, this reserve of food would be called upon, but only where neglect destroyed the plant's root system, and thus stopped it from obtaining nourishment from the soil in which it was planted. On the contrary, I have noticed, and firmly believe, that unrooted back bulbs are a drain on the plant and that it would be better without them. I have also noticed that an old Cattleya or Cymbidium bulb will not make fresh roots and will only root from the base of the new growth which results from severing. Thus, if we sever before the bulb has lost its vitality we will get a robust plant in a fraction of the time taken with back bulbs.

Provided that your plant is healthy, I think that Cymbidiums and Cypripediums should be severed in May or June, for these are the months in which the forward bulbs start to make their new growth, and the severed portion will grow in company with the forward bulbs and could flower the next year.

If a plant has a fully developed leading bulb making a strong growth, the leaved bulbs behind it can safely be severed, and will immediately flourish into strong plants provided that they have live roots to feed them. With small plants being developed, similar action can be taken with the small leaved bulbs behind the leading one, but you should be sure that the forward bulb is robust enough to carry its new growth. These small leaved bulbs make plants in remarkably quick time, and seem to have a large reserve of vitality. Mr. Les. Hawley, a leading Sydney grower, has been particularly successful with these small bulbs.

Cypripediums are a much more difficult problem, for they take a long time to recover from a setback; but since they rarely make a new growth from the back ones, severing is the only means of building up stocks. If the forward growth with its lead has one strong growth behind it, the plant can be severed at this point. I believe in leaving the plant undisturbed in its pot for at least twelve months after severing, but occasionally the plant itself will tell you that it is not happy after severing. Should this happen, plunge it in the soil of a propagating bench. I feel that Cypripedium hybrids do not like having their roots disturbed, and for this reason I recommend severing, but not dividing nor repotting. I have noticed that each time one of our most skilful Victorian growers divides his *Cypripedium Insigne* it takes them always a year, and sometimes two years, to fully recover.

If growing under suitable conditions, Cattleyas can be severed into plants of three bulbs; but never touch a Cattleya which is not healthy and vigorous. Cattleyas can most safely be severed in August and repotted as soon as the growth from the severed portion shows root. They would probably be better severed earlier, but this is very risky during the rest period. I would suggest that the time to sever them is when the forward eye starts to swell, rather than wait for it to grow. As soon as it starts to swell, the plant indicates the end of its rest period, and this should be the best time to force the old bulbs to make growth.



KEY.

DIAGRAMS ILLUSTRATING THE PARTS OF AN ORCHID FLOWER AS COMPARED WITH OTHER FLOWERS.

1, a flower of the family *Rosaceae*, cut in half. s, sepals: p, petals: sta, stamens: a, anthers: stl, style: stig, stigma; ov, ovary; ped, pedicel.

2, a similar flower drawn more diagrammatically, to show the relative positions of the parts. In the ovary can be seen the *ovules*, which become the *seeds* when fertilised.

3, an orchid flower (*Cymbidium*). Lettering as before, except c, which is the *column*, representing the separate stamens, anthers, style, and stigma of other flowers. The median petal, so dissimilar to the other two, is called the *labellum*.

4-8, Australian orchid flowers.

4, 5, front and side views of a flower of *Dendrobium falcorostrum*. ds, dorsal sepal: ls, lateral sepals: lp, lateral petals, usually just called "petals": lab, labellum (medium petal): sp, "spur" formed by the lateral sepals with the base or foot of the column. In the front view, the column is seen in the centre, capped by the anther.

What is an Orchid?

Rev. H. M. R. RUPP, *Northbridge, N.S.W.*

This seems a stupid question for the title of an article in the official journal of an Orchid Society. Yet I am assured that it is not what it seems; and that many members of our Society would welcome a simple exposition of the botanical characters which differentiate the Orchid from all other flowering plants. I have undertaken to do my best to provide this exposition. Perhaps I may be forgiven for referring readers to the comprehensive discussion of the subject in the Introduction to my book, "The Orchids of New South Wales" (National Herbarium of N.S.W., 1943), pp. v-ix.

There is nothing in the habit or manner of growth of an Orchid which will enable you with certainty to distinguish it from some other plants, in the absense of flowers. Long-sustained familiarity with the essential characteristics of Orchids may, it is true, qualify you to express an opinion on the orchidaceous character of an unknown plant with a high degree of probability; but probability is not certainty. For the latter, the presence of flowers is indispensable.

The Orchid *flower*, then, holds the key to the question with which we started. The Orchid is the most highly organised of all flowering plants. This statement is true of all Orchids, without exception; the humblest and most insignificant as well as the most notable aristocrats of the family. In order to grasp what the statement means, it is necessary to have at least some elementary knowledge of the structure of a non-orchidaceous flower.

For this purpose let us take a flower of the botanical family *Rosaceae,* to which belong such well-known plants as the rose, apple, pear, cherry, and blackberry. (Plate, figs. 1 and 2.) Each flower consists in the main of a series of "segments." Working from the outside of the flower inwards, you have first of all the *calyx*, comprising a number of segments called the *sepals*. In the bud stage these cover and protect the growing inner parts of the flower. At maturity they are usually more or less hidden by these inner parts; in some flowers, such as the poppy, they drop off when their protection is no longer needed. The next row of segments is called the *corolla*, the segments of which are the *petals*, often white or highly coloured, and forming the most conspicuous part of the flower. They vary greatly in number, and may be few or numerous. The sepals and petals together are known as the *perianth* ("around the flower"), because they surround the most important part of the flower. Inside the petals you find a greater or less number of little thin rods, apparently knobbed at their tops. These are the *stamens,* and the "knobs" are the *anthers*. The stamens and anthers constitute the male element of the flower; the anthers contain the *pollen-masses,* without which no flower could be fertilised or could produce seeds. In the middle of the stamens you see a stouter rod (many flowers have more than one) with a flattened or thickened top; and you find that it is produced below into a still stouter receptacle, often (and in Orchids always) beneath all the rest of the flower. This structure is called the *pistil,* and it constitutes the female element of the flower. It consists of the *stigma* at the top of the rod (usually sticky), the *style*, leading from the stigma down to the receptacle below, and the *ovary* or receptacle itself, containing the embryos which will become the *seeds*. Fertilisation is effected by the deposit of pollen grains on the sticky stigma: these grains then send down minute tubes of viscous liquid through the style into the ovary, where they contact the embryo *ovules* and impregnate them.

And now for the Orchid flower. This, too, has a perianth consisting of sepals and petals. But there are always *three of each*—never more, never less. And very often the sepals are highly coloured like the petals, so that you have to look at the bases to see which are the outer three (sepals) and which the inner (petals). Now comes the most important matter—within the perianth you will find no array of stamens and anthers, with the conspicuous style and stigma in their midst. Orchids have got rid of this complicated arrangement. In its place is installed a single structure in the centre of the

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6, side view of a Greenhood Flower (*Pterostylis*). The curving hood formed by the dorsal sepal and petals is called the *galea*. The lateral sepals in this particular flower are prolonged into filiform "tails" high above the galea. The labellum is protruding between the lateral sepals: the column is hidden inside against the back of the flower.

7, flower of a *Diuris*. ll, lateral lobes of the labellum. The column is just visible under the dorsal sepal.

8, flower of a large *Caladenia*. gl. club-shaped gland.

flower, called the *column*, combining within itself the various functions of stamens, anthers, style, and stigma. At its summit is the *anther*, containing the pollen-masses. (One sub-family of Orchids, including the well-known genus *Cypripedium* and its nearest relatives, has *two* anthers.) Somewhere on the front of the column below the anther is a sticky plate, the *stigmatic plate*, often simply called the stigma. Pollen-masses must be deposited on the stigma as in other flowers; the ovary lies underneath the column, and fertilisation is effected as stated above. I have not gone exhaustively into the column-structure; that is beyond the scope of this article, and I can only remark that very frequently this structure is obviously planned to prevent self-fertilisation, and to ensure cross-fertilisation by the agency of insects. In many Orchids the column is a simple and rather inconspicuous feature of the flowers; in many others it is complicated, or of fantastic design.

But now we must return to the perianth. Of the three sepals, one stands alone at the back of the flower, and is always called the *dorsal sepal*; the other two are below, one on either side; these are the *lateral sepals*, and they always form a pair, exactly similar. Two of the petals also form a pair, one on either side of the dorsal sepal. The third petal, in the vast majority of Orchids, is totally unlike the other two: so unlike, in fact, that it has been given a special name, the *labellum*. This means "a little lip," and sometimes the word *lip* is used. Labellum, however, is an easy word; "lip" is not very appropriate ("tongue" would be more descriptive), and that fact is better concealed under the Latin word. Now in the early stages of floral development the labellum is at the back of the flower; but during development, by a curious twist of 180 degrees in the ovary, it is brought round to the front, so that it spreads out from the base of the column, between the lateral sepals. It is of very great importance; for it is the highway leading to cross-fertilisation. By fantastic shapes, or by brilliance of colour, or by providing nectar or some other insect food, it allures insects to the flower, and by ingenious mechanism carried out in collaboration with the column, it ensures that the visitor, while obtaining what he came for, shall pay for it by carrying the fertilising pollen to another flower. Readers who desire fuller information on this subject are recommended to study Darwin's classic, "The Fertilisation of Orchids."

I hope I have now said enough to indicate what it is that constitutes the essential difference between Orchids and other flowers. The core of the matter is the wonderful development of the reproductive organs of the Orchid into the single structure of the column.

The Quiz Corner

Conducted by Dr. O. R. KIDD

EDITOR'S NOTE.—Answers given in this Quiz Corner apply to conditions existing in Sydney, N.S.W. Queries which cannot be answered because of consideration of space, or because they are not of general interest, will be answered at the monthly meetings and incorporated in the monthly circular.

Q.—Why do some growers enlarge the drainage hole in the bottom of a clay pot?

A.—(1) To minimise the danger of the hole becoming blocked up. The drainage hole in the pot of usual manufacture is far too small. While even a pin-hole would provide adequate drainage if it could be kept perfectly clear, the danger of blocking is proportional to the size of the exit, and this danger is very real, with very real disastrous results. If it blocks partially the plant suffers from the effects of immersion, and if completely then the plant drowns. The block is caused by the working down of the compost from continual watering, the activity of earthworms within the compost, the slip of a badly placed crock, standing the pot directly on the ground—the weight of the pot forcing a shallow plug of earth *into* the drainage hole.

It is important to remember that drainage occurs within the compost itself, due to its physical texture, and no matter what the size of the drainage hole may be, it will be ineffective if the compost itself is impervious or badly suited to the free passage of water through it.

(2) For aeration. A large hole will give more free access of air currents to the crockery and bottom layers of the compost. These bottom layers are naturally the wettest and the last to dry. Increased aeration helps to make the compost of a uniform degree of wetness and stops root rot. Stand the pots on seats, so that the drainage hole is free to drain and free to air currents.

(3) To drain the gutter which not uncommonly occurs around the inside rim on the bottom of the pot.

Q.—How often should "slippers" be repotted

(a) when potted in tan bark; (b) when potted in fibre?

A.—This is like the question, "How often should I water in summer?" It depends upon that delightfully vague word, "conditions"—the refuge for all to excuse our failures and something to be stoutly discounted when our good culture is ascribed to "good conditions" rather than our cultural skill. It is the excuse for our failures, but never the reason of our successes.

In whatever compost they may be, plants are repotted when they need it, just as they are watered when they need it. Very well, when do they need it? Broadly speaking, when the compost is deteriorated and lost the physical characteristics that it had when it was new. That is, when it has become rotted, mushy, sodden, sour, stops wet too long and drains poorly. The final criterion will be whether the plant appears to be suffering or needs more room. The compost may be bad, but the plant thriving, and this would mean that the "conditions" of exposure, watering, light, air, heat, and humidity are such that the "handling" of the plant suits the bad compost. You may provide new compost of the best materials, grow the plant under identical conditions, and the plant fail, because now the drainage and drying would be quicker and the plant, although in the finest materials, would suffer from water starvation. So, when a plant should be repotted depends not upon what material it is in—whether tan bark, fibre, moss, leaf mould, or anything else, but upon:—

(1) Whether the plant is failing, *i.e.*, this year's growth not as good as last. Exclude other causes, such as pests, thrip, scale, etc., or poor handling and culture with poor watering, too much watering, bad light, too much light, too cold, too hot, too dry, too humid. In fact, examine your cultural conditions and realise that good compost put into a pot will not alone guarantee success. It is but one factor, and you must *grow* it after you repot a plant. To repot a plant is a minute's work; to grow it is a year's study and observation.

(2) Upon the size of the plant. It may be that it simply requires more room to accommodate the root system of the anticipated new growths and to supply them with the necessary quantum of food.

Remember that how long your compost lasts before decay renders it useless depends upon the compost and its natural resistance to the wetness and heat it must withstand, its drainage, the size of the pot, where the pot is placed (glass-house, bush-house, open air), how often it is watered, humidity, heat and cold, aeration, the size of the root system in relation to the size of the pot. It can readily be seen that to answer the above query by saying to repot every year for tan bark, every two years for fibre, would be arbitrary, useless, dogmatic, unreasonable and empirical. It would rob you of the pleasure of observation, of a critical reasonable approach to the problems of culture and their mastery that really is our hobby. The flower is but the stamp on the gold—recognition of the worth of our efforts in our own eyes and those of our fellow growers.

Cattleyas

L. F. HAWLEY, *Lindfield, N.S.W.*

EDITOR'S NOTE.—A provocative and interesting article contributed by an experienced grower of Cattleyas of outstanding size and cultural merit.

● The Orchid family is a very large one. Some of its members rarely survive in captivity, some are cultured for their rarity or botanical interest. Others are grown because they are easy to grow, but if one desires to cultivate the most gorgeous and showy of all Orchids his choice will be for Cattleyas, including the hybrids derived from the inter-crossing of the Laelia and Brassavola.

To the inexperienced or unobservant grower Cattleyas are difficult. Given proper treatment they are easy. Like most epiphytes, Cattleyas are able to communicate their needs by their appearance to the grower, so it is important that if a high standard of culture is desired it is necessary for the grower to get into tune with his plants, and if the signs are interpreted correctly, the culture of Cattleyas will become reasonably simple. The apprentice, however, must not be carried away with the idea that the requirement of skilful Cattleya culture can be fully learned in a season or two. It can't. In other than exceptional cases it takes about five years to become a really proficient grower. Some growers never master the technique—others only partially so. Bear in mind that if your plants are not in good condition it is the fault of the grower. The methods used must be wrong, and the plants, by their appearance, make no secret of the fact. Yet there are collections containing large numbers of poor, half-starved, neglected, pest-infected plants in charge of growers of many years' standing. I almost said many years' experience. These growers, although associated with Orchids for a large number of years, actually have had little experience, for, as the learned Dr. Vote would say, "they have looked but they have not seen," and they have gained nothing of practical application during the years of their blindness. More will be said later upon needs of Cattleyas as indicated by the appearance of the plants themselves.

The first requisite for successful cultivation is for the provision of a suitable growing environment. In Australia this is best attained by the culture of Cattleyas under glasshouse conditions, with facilities for maintaining a minimum temperature of 60 degrees F. in the winter. Cattleyas grow well in the north of Queensland under bush-house conditions, but would probably do much better if properly housed and subjected to control, as plants—and almost everything, ourselves included—grown under artificial means produce a result which nearly always is an improvement upon nature.

Cattleyas desire a warm, moist atmosphere during their natural growing season, which, as with all plants, is in the summer, and a somewhat less moist but still warm temperature, i.e., not less than 60 degress F., in the winter. Here in Australia experience has shown that Cattleyas continue to grow in the summer in a glasshouse temperature range of 60 to 100 degrees F., and that below and above this range growth becomes dormant. Blinds or other forms of shading, plus generous ventilation and damping-down will do much in the summer to control internal conditions and enable the temperature range to be maintained. Close observation has shown that once the plant goes dormant in the summer it takes on an average three days to commence growth again. Controlled direct sunlight is essential, without which, either in the summer or winter, success cannot be attained. It can be demonstrated that plants grown cold and dry in the winter under cool glasshouse or bush-house conditions are not to be compared with plants properly cared for in heated structures. Those who grow them cold in the winter must surely do so for other than cultural reasons.

The cheapest form of heating is that provided by a coke-fired boiler from which hot water pipes run under the glasshouse benches. Gas, oil and electricity operated systems are very costly to operate, but have a nicer degree of control. The supply of gas and electricity is, moreover, subject to interruption due to labour disturbance or breakdown, and should such occur during a severe winter much damage and loss is bound to arise. On the other hand, coke is usually acquired during the summer for use in the winter, and for the heating of large houses no other form of fuel is anyway near it as a competitor.

Cattleyas are best grown in a house to themselves. If the grower has a choice the house should run north to south. Plants will then obtain the maximum benefit from the morning and afternoon sun, with a minimum exposure to the sunless south. Basket culture has some features to commend it, but where large quantities of Cattleyas are grown the use of pots produce at least equal growth and flowering results. Furthermore, pots do not dry out as quickly as baskets, are less in initial cost, and do not create the same problems when repotting becomes necessary.

Cattleyas are indigenous to South America, and many of the species are worthy of a place in any collection, whilst several produce flowers equal if not superior to most of the hybrids. These include *Dowiana* and its variety *aurea*. Both hail from Costa Rica, and are yellow in colour—*aurea* a primrose shade. The lips are crimson-purple striped with gold, a most unusual and striking combination of colour. Plenty of light and a warm position is necessary to induce the plants to flower. Shady or cold conditions are not suitable to *Dowiana*. Other than for an abundance of light and warmth its culture follows that of other Cattleyas. Cattleya *Warscewiczii* is a very fine Orchid, of lilac-purple colouration, and should be grown in similar conditions to *Dowiana*. *Cattleya Warscewiczii* variety *Sanderiana* is a very handsome dark rose variety, and has been used extensively by the hybridists. Both come from Colombia and throw from three to eight flowers of large size and good substance. *Cattleya labiata* of Brazil is another desirable Orchid characterised by large bright rose coloured flowers. There are several varieties. All are easily grown. *Cattleya Trianae*, a native of Colombia, also of rose-purple colouration, is easy of cultivation, a good florist type, and largely grown for that purpose. *Cattleya Mossiae*, from Venezuela, although grown extensively for the cut flower trade in America, is not fully understood here. It is a handsome-flowered Cattleya, rosy lilac (variable) with crimson-yellow markings on the lip. *Cattleya Mendeli*, coming from Colombia, is very similar to *labiata*. *Bowringiana*, of Honduras, makes a tall handsome plant, is easy of culture, and produces scapes of rather small rose-purple flowers—a very beautiful spectacle when flowered as a large specimen plant. There are numerous other Cattleya species, some only a little inferior to those referred to. The ones mentioned, however, are regarded as amongst the best for glasshouse culture, and from these, including *Brassavola Digbyana* (Honduras), have been derived most of the present day hybrids, which, generally speaking, are more easily cultivated than the species.

The Brasso crosses contain some of the finest hybrids in cultivation. Usually the flowers are large, of good shape and texture, possessing a more or less fringed lip inherited from the *Brassavola Digbyana* parent. The Cattleya and the Laelia Cattleya hybrids are a large family, and whilst some rival the Brasso crosses the majority, whilst beautiful, do not equal the stage of development or colouration of the latest Brasso hybrids. Strong healthy plants should be potted in a mixture of Osmunda fibre or its nearest substitute without the addition of any other ingredient. Weak plants and others with poor root systems need the addition of Sphagnum moss—up to one-third—to the fibre compost.

Where large collections of Cattleyas are grown, losses are inevitable, even as high as 20 per cent. in some of the American establishments. A grower will be doing very well indeed if, being possessed of a collection of, say, 50 to 100 plants, the mortality rate can be kept down to about 5 per cent. This does not mean that the days of the collection are numbered, for, whilst a percentage of the plants will be lost each year, others, on the other hand, will increase in size and vigour and become subjects for division, thus reducing the loss ratio over the whole.

In Australia Cattleyas can be repotted in perfect safety at any time during early summer regardless as to whether the eye of the lead is swelling, or has come away, or whether roots are commencing to develop from the last lead. If the work is performed during early summer it will not be long before the plants, if not already in growth, start to get a move on, and they might just as well do it in new compost as old. If a plant commences to make growth during the winter, and is in need of repotting, do not approach the matter in a timid state of mind or debate whether the job should be postponed, as most text books say, until the spring, when the roots are just about to break from the base of last year's lead. Get on with the work without hesitation, even though it be in the depth of winter. The plant will respond and continue to grow and root when the time comes, and will be all the better for its winter disturbance. *(To be continued)*

Notes for Novices

T. H. JAMES, *Hazelbrook, N.S.W.*

● It is over two years since I last wrote for *The Australian Orchid Review*. Several motives actuated the discontinuance, but probably the most active was a realisation that I had been writing regularly for *The Review* for over seven years, and that surely I had long overstayed my welcome. Again, the seasons come round so regularly that cultural advice consists largely of a repetition of last year's notes, even if it is camouflaged with different verbiage.

I have now been asked to again write some notes, and have much pleasure in doing so.

Having made that decision, I re-read my old notes and, being a foundation member of The Orchid Society of New South Wales, I find that they reflect in a sense the gradual development of cultural knowledge among the members. I marvel now that my Orchids survived the application of early ideas, particularly those held prior to the birth of *The Review*, and I believe that it was only the amazing tenacity of life of many Orchids that enabled them to carry on until more rational methods saved them from the mortuary.

The number of devotees of the Orchid Cult has increased enormously during recent years, but the later recruits have an advantage over the pioneers in having access to the cultural knowledge of to-day.

I wish it to be understood that these notes are being written for the novice—and there are many of them to-day. Older growers have either achieved success, or a fair measure of it, or they are too conservative to admit their failure. Those may skip these pages.

I expect that most of you, particularly those who attend meetings of the various Orchid Societies, have learned that it is not possible to dogmatise on the correct treatment of this or that genus of Orchids. All that can be done is to generalise on broad principles which could be applied with suitable modifications to the grower's particular conditions. And so to business.

Spring has arrived again, and with it the quickening of plant life. That may not be so apparent in the city as in the highlands where I live, and where the majority of the trees, outside of the natural bush, are deciduous, and spring, with its wealth of young foliage and flowers, is very real. So with our Orchids. Their requirements demand much from us in the way of attention to light, ventilation, watering and repotting.

Light.—What a contentious subject this has been! I well remember, some years ago, complimenting one of our now very successful growers on his magnificent foliage plants, and his indignant retort that the plants were Orchids. His glass and bush-house were so dark that one almost required a torch in daylight. Needless to say, he got very few flowers. When it is realised that most of the Orchids we grow, with the exception of Cypripediums, are found in nature high up in trees, on rocks, or in other positions where light is abundant, it will be understood, and it now generally is, that to obtain flowers plenty of light must be provided. For the glass-house I consider blinds unnecessary and, even over clear glass, would shut out far too much light. Covering the glass with a thin coat of such as mill white is quite sufficient. An ideal plan is a moderately thick coat stippled with a rubber sponge or a piece of mosquito net to permit pencils of clear sunlight to enter. But that is one of the things one tells the other fellow to do. I tried it once, but now take the easy path. I make a thin lime paste with a little linseed oil added and apply it to the roof with a spray pump. Time, about five minutes. It sticks very well except under an extra heavy thunderstorm, but then it can be so easily renewed. Also, it saves a lot of trouble where wire netting is fixed over the glass and which, when the spray is used, need not be removed. For the bush-house the simplest and most effective is wire netting—four-inch mesh for preference—sparsely laced with ti-tree; but give complete protection from south and west.

Ventilation.—From now on open all ventilators both day and night, although use some discretion, particularly during September, when the weather can be changeable. Should cold or hot winds develop, close ventilators on the windy side. The bush-house, of course, ventilates itself, but, even in summer, shelter from cold southerly winds is essential.

Watering.—This is a troublesome subject—troublesome because one cannot say "thus shall it be," as house conditions are so diverse and composts so varying. Therefore, this is where individual attention pays dividends. New growth will already have commenced, or soon will. Root action precedes new leaf growth, and the first visible evidence is green tips on roots. Watering may then be commenced, but sparingly, increasing as more active growth develops until the warm season has become definitely established in October, when you can be reckless. From October on water freely and overhead. If one watering only is possible each day, apply that in the evening, as that ensures a damp compost over a longer period than watering in the morning only. Do both if possible. Also keep floor and benches damp. To conserve moisture, top all containers with moss, live Sphagnum if possible, and also pack sides of baskets with moss.

Repotting generally should be completed by the end of September. I believe that most Orchids should be repotted at least every three years, some more frequently. If left undisturbed for several years composts, even fibre, tend to decompose into soil, and the plants suffer, particularly in winter.

Cattleyas.—On account of the considerable crossing of genera and species, Cattleyas do not have a definite period of growth and rest, so watch them carefully, and at the first sign of root action begin watering or repot if they need it. If in pots a table knife could be carefully passed round the inside of the pot to disengage the clinging roots, and then a little pressure through the drainage hole should force the plant out. If the plan be to leave the plant intact and repot into a larger vessel, cut away dead or damaged roots and remove all compost which has become soft or rotten. If live roots are woven into hard fibre, do not disturb them.

Now about those back bulbs. I consider two behind the lead quite sufficient. Most Orchid growth is progressive, and the new growth makes its own roots. The bulbs—really pseudobulbs—are only necessary to start the new life and keep it going until it can fend for itself. If you are doubtful, leave three bulbs behind the lead; the remainder is only an encumbrance. Cut the rhizome where desired and either leave the back bulbs in the clump to build up a specimen or place them in a separate pot.

As to compost, the general material is Osmunda (when procurable) or black Todea fibre. Even the Todea is often difficult to obtain, and other materials suffice equally as well. After all, I do not believe there is over much plant food in the fibre, and the compost seems to serve mainly as a host. I have had good results with tan bark from which the very fine part has been sifted. Sometimes I have mixed a little fibre with it and again some cinders, sifted, from the railways. These mixtures require more copious waterings than the fibre, but, if topped with moss, sufficient moisture can be maintained. An occasional dipping is advised in case the compost has become dry unnoticed, in which case ordinary watering just passes over without wetting the compost. Do not use moss in the compost. It might be well enough in a heated house, but in a cool house it will be difficult to regulate the condition of the compost during winter, as the moss soon decomposes into a kind of soil and remains wet for a long time.

There is a difference of opinion as to whether the compost should be rammed tight and hard or only moderately so. Personally I do not like the hard packing, and make it only so firm as will maintain the plant in position, and this can be done with the fingers alone. The new compost when being used should be on the dry side. Do not water at all for several days after repotting, and then very sparingly until rooting is well advanced.

Dendrobiums.—As for Cattleyas.

Cypripediums.—Most of these have finished flowering some time since, and any repotting needed should have been completed. These require a moderate amount of shade during most of the year and plenty of water, particularly if in tan bark. Water overhead, be liberal with it, and apply in the evening, also in the morning if possible.

Cymbidiums.—These will now be in full flower, but do not let that interfere with repotting if that be due, as the flowers are sustained by the energy stored in the bulbs, and repotting will not affect the blooms. This job, which I prefer to do every two years, should be completed by the end of September at the latest. Unless new growth gets an early start it cannot mature sufficiently in time to produce flowers in the following spring.

Use dry or nearly dry compost when repotting and do not pack tightly. Water sparingly for a few weeks. Plants in flower should not be allowed to become very dry, as the drain on bulbs by the flowers and lack of water may cause the bulbs to shrivel.

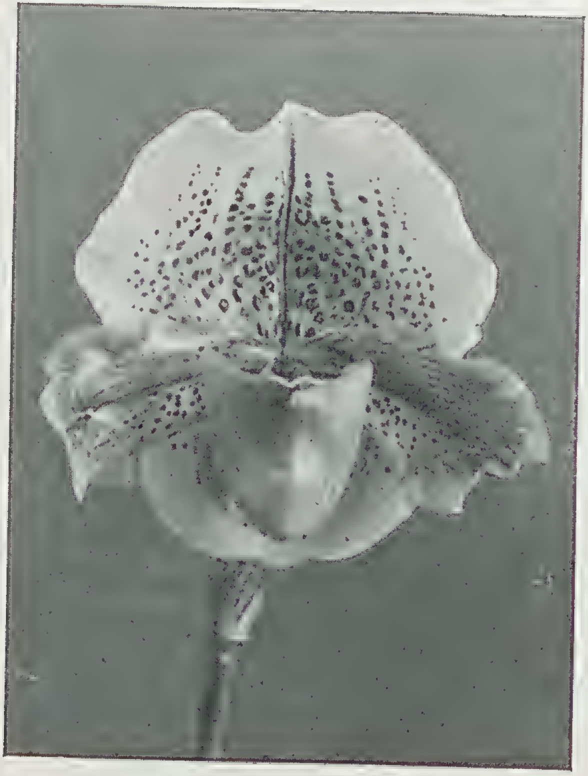
This genus is not over-fastidious about compost except that it must be an open mixture, contain a fair amount of nutriment, and be of a nature that will remain moist without being wet. The treatment of Cymbidiums has been dealt with so fully in the *Review* that it would be superfluous to detail it here. Suffice to remind that abundance of light and air are essential, also protection from cold winds. Keep the pots off the ground to permit air reaching the roots and prevent worms and other pests entering.

Thunias will now have started their new growth. These must be repotted each year, as the whole of the roots die after the bulb has matured, and also the soil has become exhausted. Cut away all old roots and last year's shrivelled bulb. Repot in light, rich mixture, which should not be packed too tightly. A stake will be necessary to which to tie the bulbs. Water very sparingly until new growth is about two inches long, then gradually increase. When new growth is well advanced, water copiously. Place in full sunshine until flower spikes appear, and then place under shelter to protect the flowers and elongate the sprays. They generally flower at Christmas.

Many growers seem to have difficulty in flowering this lovely Orchid, but if treated as indicated there should be no trouble, although the treatment received during autumn is important, of which more at a later date. Regular application of liquid manure is beneficial. In June, 1943, I had about 50 plants, embracing four species, viz., *Marshallianum, alba, vanosa* and *Bensonii.* A few weeks later I was caught napping as a mild, cloudy night was followed by an exceptional frost, the thermometer dropping to 20 degrees F. I saved one *Marshallianum* and two *vanosa. Th. Marshallianum* is the most attractive of the species, but *Th. Bensonii,* a mauve flower, is also worth while. Incidentally, if any reader has *Th. Bensonii* I should be glad of a plant in exchange for something else.

Zygopetalum, particularly *Z. Mackayii,* the species most generally grown, should be in every collection. It is easily grown, and a most unusual and attractive flower. Treat as, and grow with, Cymbidiums. It is a gross feeder, and would repay if repotted each year. The flower spikes appear in the early stages of the new growth. The bulbs take two years to mature.

Phaius have become more popular of recent years. They are very attractive and easy to grow. In and about Sydney they could be grown with the Cymbidiums provided an abundance of light is afforded, but they would need the protection of a glasshouse in winter. They are also gross feeders and, being swamp plants, require an abundance of water during the growing period. They prefer a rich, light compost, for example a Cymbidium mixture with rather more leaf mould and old cow manure; also, possibly, some peat moss. Repot each year. Two bulbs behind the lead are sufficient. Back bulbs make up very quickly, and should flower in two years. I have found *Ph. Wallichii* the easiest species to flower, but from a floral point of view I prefer *Ph. Norman.* This latter species has a habit, with me at any rate, of making over-many new growths, and these, if all be allowed to develop, would



CYPRIPEDIUM EMBERTON, *var, Dawn*
Awarded "A.M. 1945" O.S. of N.S.W.
Exhibited by Reg. Richards.

interfere with flowering, so I remove all except one, or, if the bulb be particularly large, two at most. Flower spikes are usually produced in spring from the side of the new bulb, but during the last two years my plants have flowered, also, from the centre of the new growth. On one plant this year, two spikes from the sides and one in the centre.

Note.—In a future issue I shall deal with other genera which can be successfully grown in a bush or unheated glasshouse. It is pleasing to note the increased interest in "something different." Beautiful as are the standard items, Cattleyas, Cymbidiums, and Cypripediums, there are many equally beautiful among the other genera, and they add attraction and interest to a collection.

● *Name registered.*—Mr. Carrington H. Deane has been informed by Messrs. Sanders (St. Albans) Ltd. that *Cymbidium Lowianum* x *Flamenco* has been registered in England as *Cymbidium Girrahween.*

The plant of this cross, flowered in Sydney by Dr. K. Kirkland last year, and awarded a "First Class Certificate, 1944," has been given the varietal name "*Enid.*"

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THURSDAY, 25th OCTOBER
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Meeting Place: Miniature Rifle Range Building, Boundary Street, Brisbane. Meetings held on the Second Friday of each month. Visitors are welcome.

The Victorian Orchid Club

Meets on the third Monday in each month (January excepted), in the Australian Church Hall, 15 Russell St., Melbourne, at 8 p.m. Prospective members welcome.

The dates of the next meetings of the Club are as follow:

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AUSTRALIAN ORCHID REVIEW

Volume 10 **DECEMBER, 1945** No. 4

The author of each article is responsible for the facts and opinions expressed therein.

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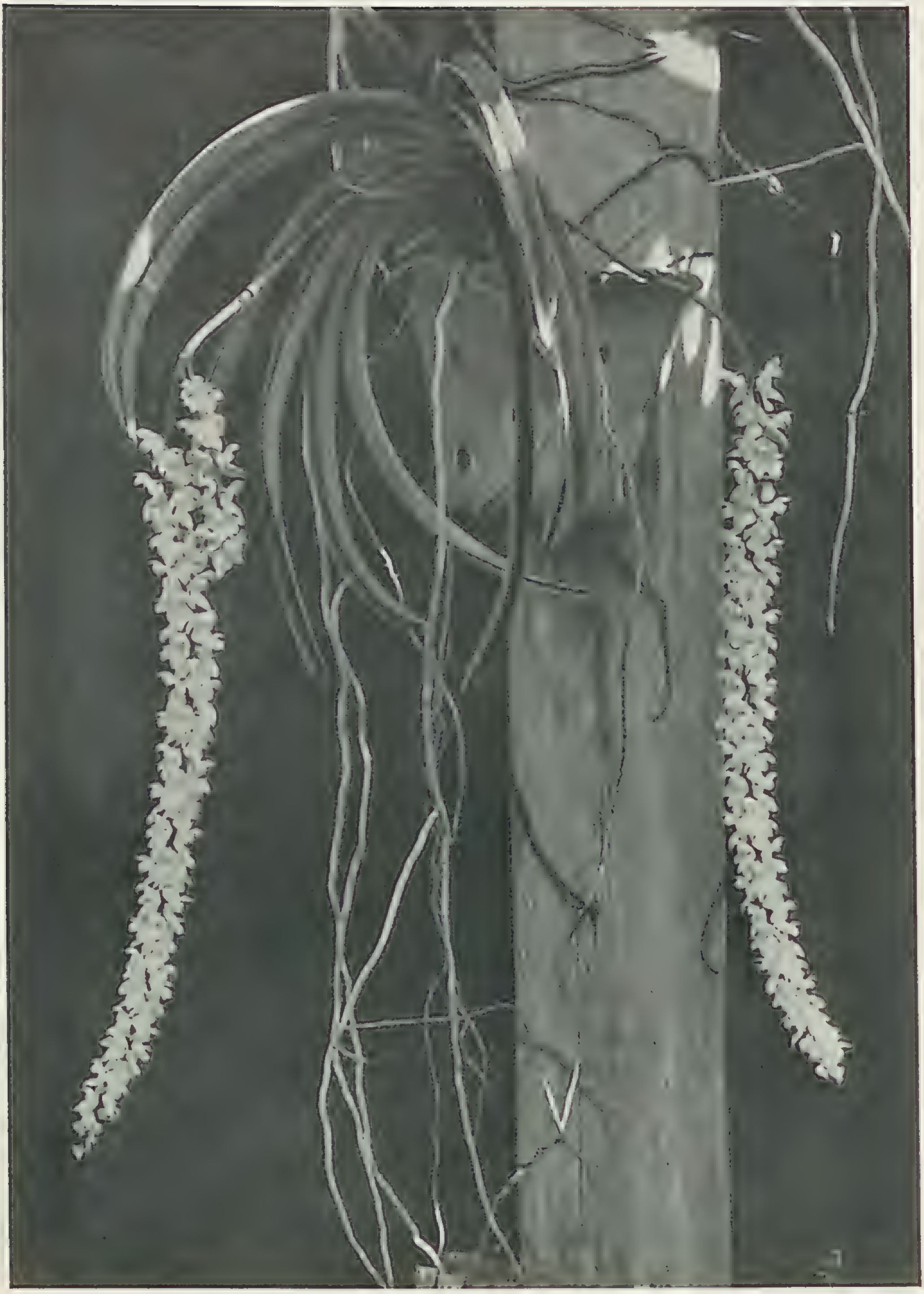

AERIDES FIELDINGII

Grown by Mr. T. Harris, Coolangatta Qld. This fine plant was procured through the Queensland Orchid Society in 1939. It carries two sprays 18 inches in length of white and deep mauve flowers. Hanging suspended in a glass-sided house, it has taken kindly to the rough post supporting a batten roof. Coolangatta is a well-known seaside resort, and the temperature seldom falls below 45 degrees.

A Victorian Christmas Message

● It is with pleasure that I take this opportunity of conveying seasonal greetings to all Orchidists, and, in particular, to members of Orchid bodies in Australia.

The year has been a memorable one. At last peace has again come to the world, and it is a universal prayer that it may evermore remain with us. During the war-period Orchid growing went on, and in Australia definite progress was made. To the weary worker, attention to the plants was a recreation and a labour of love. To the battle-worn serviceman, brief hours of rest or leave brought many thoughts—some worrying, some soothing—of loved ones at home, the plants in the garden, and the Orchids ni the glasshouse. War in the Far East led men to where the Orchids thrive and many for the first time probably were moved to admiration—and desire to grow a few when back home again. To these men all Orchid lovers and owners will, I am sure, give every encouragement that they may once more become rehabilitated. The peacefulness and beauty of the Orchid house can do much to help these men forget "other days."

The war has caused a severe curtailment in the production of new hybrids, especially in England it will take some years to make up the leeway in this direction; but Australia has within its own shores a supply of Orchid plants which by natural increase will help to supply our needs. So let us be happy and contented with what we can get, for truly, we can love "the meanest flower that blows."

To our Victorian Orchid Club members I send a special greeting. The increasing membership, the enthusiastic spirit as evinced at our monthly meetings, the large attendances, the whole-hearted co-operation and good fellowship, and the inspiration derived from our Town Hall display—all augur well for even greater interest, study, development, and, above all love of the cult of nature's most wonderful flower. We sincerely feel—one and all of us, I am sure—that the coming year will bring us greater peace of mind, happiness and human fellowship than we have been able to enjoy during the past six years, and our common interest—the love of the Orchid—will do much to achieve that most desirable end.

Finally, I wish to thank all the members personally for their most kindly spirit of co-operation and help, and all the committeemen for the whole-hearted manner in which they have helped the Club's activities and progress.

May you all have a Merry, Merry Christmas, and a Brighter, Happier New Year!

R. VICK,
President, Victorian Orchid Club.

A Cymbidium Novelty

● Exhibited at the Victorian Orchid Club's display, in the Melbourne Town Hall, on September 4th, 5th and 6th was an interesting plant of the well-known and popular Cymbidium Lowianum.

This plant "sported" three or four years ago, in the house of one of the club's members, who is now on active service. The variation takes the form of white stripes down the leaves, particularly near the edges. When exhibited it carried two spikes of flowers which likewise carried the variegation in the sepals and petals. The central portions of these were green, then a band of lighter colour, finishing more or less with a narrow green edge. The crimson band in the throat remains unaffected. The plant is flourishing and has already broken into new growth.

As far as is known here, no variegated form has previously appeared among any of the cultivated Orchid species or their hybrids.

R. VICK, Canterbury, Victoria.

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The following varieties are recommended as being lovely and easy to grow in the vicinity of Sydney and in the North Coastal areas of N.S.W.

Species.—Nobile, the ordinary type and named varieties, Jamesianum, infundibulum, thyrsiflorum, densiflorum.

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Points in Potting and Culture

C. A. HILSDEN, *Brisbane, Q.*

● Having visited many collections and noted the methods of other growers, as well as listened very attentively to lectures and discussions at our Society's meetings, I have been impressed from time to time by the different opinions of growers and their method of treatment of the same genus. While it is not my intention to condemn nor uphold any special method of culture, I would like to bring forward a few points that, to my mind, are worthy of the fullest discussion as a measn of guidance to many younger and less experienced members. Maybe, thereby, we can improve on our own methods and ideas.

Let us, then, deal firstly with the question of tight or loose packing of the compost. This question naturally would vary with the particular genus concerned. We will therefore take Dendrobiums and Cattleyas, which may be bracketed together as requiring similar potting conditions. By examining the natural way these plants grow, we find that they attach themselves to trees by sending out their roots to fasten in the crevices of the bark, whereby they absorb moisture and nourishment to grow. Their roots, therefore, are neither confined nor covered, but are free to travel at will, that is, speaking generally. Is this, therefore, any reason why, when the plant is removed from the tree, it should be rammed and compressed as tightly as is possible to pack it into a pot or other receptacle?

This brings to my mind that on one occasion a member exhibited a most cruel instrument, fashioned in hardwood, with a sharp point at one end and a fearsome knob at the other, which he termed a potting tool! Imagine the torture suffered by the plants and damage to the roots in the process of being packed, probed, jammed and compressed into a small space and made practically airtight! This type of potting tool brought forth the information from another member that he used a similar instrument, but his was made of steel! Of course, it is not suggested that a plant should be loosely placed in a pot with the compost lightly scattered around the roots, etc., as this treatment would be both foolish and fatal.

On the facts, therefore, it seems that both Dendrobes and Cattleyas require to be well potted, with the compost packed between and around the roots, in such a manner that the plant is held firmly in the pot, and if compressed thumb-tight, the compost will not be springy. Some growers, when potting, use the compost in a dry state, while others prefer a moist compost. The users of dry compost say that after potting dry and immersing the pot in water, the compost expands and tightens. But by using moist compost, one avoids a springy potting, as it is easier to compress when moist.

With other genera, such as Cypripediums and Cymbidiums, whose roots in nature roam amongst rocks, mosses, and leaf mould, and grow through the hollow trunks of trees to feed on the rotten pulp, even to reach to the base of the tree and enter the soil, it is obvious that a somewhat looser potting compost is required. Therefore, when potting these plants, the compost should be packed sufficiently to hold the plant firmly in position, but not rammed in under pressure. If we bear in mind the natural conditions under which these plants grow, with a little practice the degree of thumb-tight potting is soon acquired. The same remarks may also be applied to Vandas, Aerides, Phalamopsis,

My second subject for discussion is a matter that has been more or less a debatable point for many years. Is pot culture more or less successful than basket culture?

Firstly, let us consider pot culture. It must be conceded that a plant is easier to handle in a pot than in a basket when the time arrives for repotting. In many cases the basket has to be broken apart to release the plant with the smallest amount of damage, whereas usually a sharp tap or two with the help of a push through the drainage hole of the pot will release the whole contents *en masse* without damage. Again, moisture is better retained and easier to apply. When repotting, one notices that with a well-grown plant, the root system is extensive, and the roots have clung to the crocks and sides of the pot, which shows that they appreciate the moisture and coolness of the pot, which is denied to them in basket culture. Much less space is required for a collection, which makes for better arrangement and a more systematic display. The quantity of compost required is more economical in pots.

Now if one argues that baskets or rafts are more suitable, then to be consistent the majority of our plants should be in baskets; but in all collections the reverse is the rule. If baskets are much better than pots, we would need many different sizes of baskets, and a much larger area for hanging our plants. Again, for exhibition purposes a real problem would arise in displaying our many blooms to advantage. I have found it very difficult to judge the varying moisture requirements of plants when grown in baskets, as they dry out much quicker than when potted. Maybe this is the reason for so many roots appearing from baskets, as though they are seeking moisture from the atmosphere. To water the baskets sufficiently, it is necessary to immerse them in water. This would have to be done frequently, as they dry out so quickly; but with a fair-sized collection, this would occupy more time than could be spared, hence the plants suffer from lack of moisture during their growing period. Further, to administer a stimulant such as blood-and-bone or other chemical fertiliser as recommended by some growers, I have been advised from time to time to sprinkle a little over the top of the pots (emphasis on pots) and wash it in. But with plants in baskets it would be washed out. Finally, we see some beautiful specimens exhibited at our monthly meetings, and possibly 75 per cent. of them are grown in pots. It seems, therefore, that pot culture is easier for management and display, requires much less space, is more economical, and gives just as good results.

Since a number of highly successful exhibitions have been held in Sydney of recent times, one often hears the remark, "They grow so much better in the south." Referring mainly to Cymbidiums and Cypripediums there is a small amount of truth in the remark, but not to such an extent as Southern Queensland growers think. In our climate, with a little more consideration for the plants' requirements, we should be able to grow these genera almost as well as our southern friends. Unfortunately, we are trying to grow successfully too many genera requiring different conditions in the same house. Obviously, if the conditions of a bush- or glasshouse are suitable for Dendrobes or Cattleyas, then they are not suitable for Cyps., unless the house is long enough to be divided off, so that one portion may be well shaded without affecting the other portion. I would suggest that to grow Cyps. successfully, a separate house or an annexe from the existing house be provided, whereby Cyps. would be grown apart from other genera and given the extra shading, spraying, and subdued light as required. This genus would be more popular, more extensively cultivated, and new varieties raised, which would favourably compare with our southern growers, if more attention was given to its requirements.

A similar position arises with Cymbidiums. Some of our growers still perservere with these plants in a well-battened-in bush-house, with the roof also battened to break the sun's rays from other plants. I must admit that their plants grow well, and show nice green foliage, but where are the flowers? For years I grew a few very nice plants under similar conditions, but hardly ever was I rewarded with sprays of flowers. Cymbidiums enjoy very open situations, where they can revel in the morning sunlight, with a light shading from the burning afternoon sun. Hence a northerly or north-east aspect under a tree or a few maybush twigs on wire netting is ample covering for this genus, as the sunlight brings the flowers. Might I add that direct sunlight is also necessary to grow successfully Terete Vandas and their hybrids? A similar position directly in the open where these plants can revel in the sunlight up to midday is ideal. It is advantageous if the plants are in pots, to sink the pots in a trench of old compost outside the bush-house, as this keeps the pots cool and moist, with the lawn clippings scattered around them. After a season outside, these plants do not suffer through the average winter unless the situation is very low where severe frosts are general.

In concluding this short paper, I trust I have not wounded the susceptibilities of any of our growers, but have made an honest attempt to encourage a healthy and friendly discussion of some of our methods whereby we may obtain more successful results from our labour of love.

Returning Prisoners of War.

● Readers of the *A.O.R.* will be pleased to learn that the two sons of the President of the Queensland Orchid Society who were held prisoners of war in Singapore are now safe and on their way home. Congratulations, Mr. Hilsden.

Dendrobiums.

● When newly repotted should be only lightly watered for a week or two until they are established.

To ensure a quick growth the plants must now be receiving a liberal supply of water and the maximum amount of checkered sunlight.

Victorian Cultural Notes

December, January and February

R. BRUCE HOGG, *Brunswick, Vic.*

● For all Orchids this is the period in which you build up the vitality of your plants for next season's flowering, and to a large extent the quality and quantity of flowers which you will get will be dependent upon these months.

The weather during this period will be hot and dry, and all the moisture possible should be given—on the plants themselves sufficient just to keep them moist at all times without being wet, and on the benches and on the floor to ensure a sufficient supply of atmospheric moisture. At night, if it is one of those hot unbearable nights, a damping down before you go to bed will do a world of good.

During this period also, your plants should be hardened, and in consequence, the greatest possible amount of ventilation admitted. With Cymbidiums, keep every possible ventilator open, and in still weather leave your doors open as well. Slippers can be treated similarly, but in the case of Cattleyas you might find it difficult to hold the necessary amount of atmospheric moisture with the doors open.

You will have finished potting your Cymbidiums and your Slippers, and you should keep a watchful eye on them for any scale or other pest which may attack them. If you see signs of scale, particularly on the edges of the leaves of Cymbidiums treat them by making up a mixture of Volck, one in forty. Dip every plant in this, lay it on its side and dry and then put it back on the bench. I find this a good practise as a safeguard even though the scale is not visible. Should you be worried with other pests as well, Pestoxol should be added to the Volck, and in the case of mealy bug, owing to its habit of protecting itself behind a web, Pestoxol should be mixed about one in twenty to attack it, but for thrips, aphis and other insects, one in forty is sufficient strength, and even less could be used.

While these are the months of a general build-up of vitality they are also the months of considerable danger, and great care should be taken with your shading. The bright, hot sun from 10 a.m. until 4 p.m. should never be allowed to find its way direct into your house, but your plants will benefit if you can find a means of allowing the early morning and the late evening son to penetrate. This will indicate on all bright days that your blinds should be lowered before you proceed to work and raised as soon as possible on your return from work. Your Slippers should have an extra shading which is permanent. The best method of doing this is to tack a strip of light hessian or cheese cloth on the inside of your rafters in such a manner that they shade only the Slippers and not the other plants. Should you inadvertently fail to lower your blinds on a hot sunny day, Cattleyas and Slippers in particular are likely to suffer grave harm, and a few hours of sunlight focused on the plants could, and will, kill a number of plants if they generate sufficient heat on the foliage.

If your plants are well rooted, patricularly your Cymbidiums, they will benefit during these months by a mild application of some form of liquid manure every fortnight, but if you use it on Slippers it should be as mild in strength as possible. Do not use manure on Cattleyas on any account.

The only Orchids which you will consider repotting during the months under review would be Cattleyas and Dendrobiums, and these plants should be carefully watched for the appearance of the new roots and potted as soon as the roots show signs of developing. On the contrary, however, if you have a plant which should have rooted some time ago and has refrained from making root it is obvious that the plant is potted in fibre which it does not like, and by repotting now on good fresh fibre the plant will be encouraged to immediately send out new roots. Act in this manner, however, only with those plants which have not made root as they should have.

You may have a few Orchids in flower now, including those of the Miltonia and Odontoglossum family.

During the latter period under review, with some of the earlier Slippers you will notice the flower sheath at the base of the growth, and in the case of some of the earlier Cymbidiums the flower growth breaking out at the base of the lowest leaf.

You will find it in the *A.O.R.* if *you* send it along. Photographs, Experiences, Information.

Notes for Novices

T. H. JAMES, *Hazelbrook, N.S.W.*

● The summer, which is the main growing period for most of our Orchids, is now with us and, all the hard work of Spring such as repotting, adjusting light and many other odd jobs having been finished, we can settle down to the seasonal routine of watering, attending to ventilation and coping with wogs, if any. Strangely enough over the many years during which I have been growing Orchids, the only pest which has worried me is the white scale that attacks Cattleyas and that has not been severe. Possibly one of the reasons is the damp but airy atmosphere during the hot months and the liberal overhead spraying particularly in the evening. Thrips cannot thrive in a moisture laden atmosphere and are often present in those very clean, tidy houses with spotless floors and benches which refuse to hold moisture. I have always preferred an earth floor in which I grow Rex Begonias, ferns and such like which help to produce a jungle atmosphere with that pleasant warm, moist smell which renders the use of a hydrometer unnecessary.

At this stage I might well repeat a remark I made in an early issue of *The Review*, viz., I firmly believe that the compost used is not the vital factor generally acclaimed but that light, air and water are much more important.

Many of you will have noted that quite a number of growers have their pet composts and attribute their success to it. I am referring particularly to Cymbidiums and Cypripediums. The compost for epiphytes does not present much scope for variety. Do not let those pet composts worry you.

The compost should, of course, be appropriate to the particular genus but may be of any suitable material provided it be open and moderately absorbent and, for Cymbidiums and Cypripediums, contain nutriment of some kind. In such a compost water may be supplied in abundance without danger of it becoming sour or soggy. The containers must be well drained. This is a vital factor.

Cleanliness is very essential. Merely hosing the foliage is not sufficient to wash off dust which seems to cling like a film and requires sponging to remove it. Dirty foliage cannot function healthily and so will adversely affect growth.

Cattleyas.—As with many aspects of Orchid culture in which apparently contradictory opinions confuse the novice, so with Cattleyas. Among the rapidly increasing number of Orchid enthusiasts are many whose success with Cymbidiums has tempted them to aspire to Cattleyas. To the query "Can we grow them without heat" I reply definitely "Yes." The only concessions that I will make to the opposition are that in a heated glass house the growth may be more luxurious and that, without heat it is not possible, *in the general type of glass house,* to flower Cattleyas successfully in winter. However, if the glass house be built against a brick wall facing north with about three feet of brick in the remaining three sides, sufficient warmth would be stored during the day to prevent the temperature dropping too low during the night to affect the plants. Mr. McDonald, of Summer Hill has such a house and I have seen many scores of beautiful fully developed blooms produced in his glass house during the winter months. In a house which was entirely of glass and therefore had no capacity for conserving warmth, I grew Cattleyas at Longueville for 10 years and they progressed, with an occasional exception, each year and flowered freely. In the spring and early summer of last year I had about 150 blooms including one plant with 18 and another with 31. I have had those plants for over 12 years and during the whole of the last two winters here (Hazelbrook) the morning temperatures in the glass house has ranged between 34 and 44 degrees and lower on odd occasions. Of course, I would not choose those conditions to commence growing Cattleyas but such low temperatures do not generally occur in or around Sydney. So, to those who wish to try Cattleyas, I would say "Go ahead," but "hasten slowly." You must not expect luxurious growth right away. Being a new venture results might possibly, but not necessarily be disappointing at first, but does not that apply to any new ventures and it would not necessarily be absent if the beginning were made in a heated house. Did you all have immediate success when you started growing Cymbidiums? But, and this is important as regards the usual type of glass house, do not use any material in the compost which is over retentive of moisture as that would cause trouble in winter.

Cymbidiums.—Will now require copious watering and should not be allowed to become dry. After hot days spray the foliage in the evening. Weak liquid manure about once each fortnight would benefit the plants particularly as the flower growths will be developing during late January and February. Another reminder —keep the pots off the ground even if only on one inch strips of wood. This is necessary to permit air to reach the roots and also to prevent worms entering the pots and clogging the drainage.

Miscellaneous.—In addition to those lines mentioned in my previous notes the following should grow successfully in an unheated house; Coelogyne cristata, Oncidium variecosum Rogersii, Odontoglossum grande and Lycaste Skinnerii.

Coelogyne cristata.—There are two types in cultivation one with short and the other with long rhizomes. The flowers, which are large and white with a yellow lip, vary slightly the latter being sweetly scented. A good method of treating the long rhizone variety is to grow it in a wire basket around which the growths could be trained and the roots could readily enter the compost. It could also be grown on a large section of tree fern trunk. An ordinary pot would soon become useless. A Cattleya compost is usually advised but I found that unsatisfactory and had success with a Cymbidium compost with a little fibre added. The short rhizome type makes the better floral display and is easier to handle. For it use a large vessel, shallow for preference but if ordinary pots be used half fill with drainage. Large vessels are advised as this species resents repotting and will frequently refuse to flower for some years after disturbance, although I have been told that, once established here, it does not resent repotting as much as do newly imported plants. A cool situation is required but a reasonable amount of light is necessary to induce flowering.

Odontoglossum grande produces rather startling but very attractive flowers up to 7 inches across, the colour scheme being yellow and brown. This species is a native of Guatamala and is much hardier than the majority of Odontoglossums. It does well suspended among the Cymbidiums. I have grown it well in a Cymbidium mixture with added fibre.

Lycaste Skinnerii is, I consider, the most beautiful of the genus and is easily grown. Compost as for Cymbidiums with larger percentage of tan bark or other material which would open the compost a little more. I have seen photos of remarkable hybrids in English collections but have not seen the flowers here. When import restrictions are removed I would urge an endeavour be made to obtain some of the new forms. Well grown plants produce very many blooms. The greatest number that I have noted in records being 36 to the bulb. The most I have seen here is 13.

Another comment. Do not accept without critical examination indiscriminate advice offered about this and that. Remember that the adviser's conditions may be totally different to yours and his advice quite unsuitable for your conditions. I know of a grower who alters his system every time a fresh visitor tells him his practice is quite wrong. Judging by the Cymbidiums we have seen lately the culture generally of that genus seems to be well understood and is of a high order.

Western Suburbs Orchid Society, N.S.W.

● The Western Suburbs Orchid Society held its First Annual Show on September 1st, 1945, at the Petersham Town Hall.

The show was officially opened by Lady Julius and the proceeds were in aid of the Crippled Children.

The exhibits were of a very high standard and included a non-competitive display of Westonbirts by Mr. Shead.

A beautiful Westonbirt "Eagle" exhibited by Mrs. Mitchell attracted much attention and won the Bushell Trophy for the best Cymbidium in the open classes.

The President's trophy for the best Cymbidium exhibited by the members was won by Miss P. Hedger with "Princess Elizabeth."

The society can be congratulated on a most successful show and the high standards of exhibits.

We Too Have Our Troubles.

● This December issue of the *A.O.R.* has been long overdue and is produced under difficulties.

We regret that it was not possible to let you have your copy earlier.

The delay was caused firstly by industrial troubles followed by a general ban on the use of light and power for industrial and business purposes.

The 1945 Exhibition

● Following on a decision by the general meeting of Members, the New South Wales Society resumed its Annual Exhibition on September 12, 13 and 14th, after a lapse of five years. It was held in Beard Watsons' premises in conjunction with the British Centre who will benefit as a result.

Up to the outbreak of the European War the Exhibitions showed a steady improvement from year to year, due to the culture of the plants being better understood, the increase in the size of the plants, and a corresponding increase in the number and size of the blooms.

Then came the bombshell! War in Europe! Soon the whole world was at war. No one could forsee the future, what we would be called upon to do, whether we would be here or not to tend our plants.

The Committee decided that it was no time for flower shows and much to the disappointment of us all, of necessity, the Exhibitions terminated abruptly.

From time to time the matter of resuming them was raised. The petrol position and transport difficulties were the deciding factors against an earlier resumption.

The war in Europe was won and the tension lessened. After much discussion it seemed that it might be possible to again stage an Exhibition of pre-war magnitude.

The decision was received with a deal of satisfaction by Orchid lovers. A show committee was appointed to carry the decision into effect and Mr. F. White carried out the duties of Secretary to the Committee admirably.

Some difficulty was experienced in obtaining suitable premises but finally Beard Watson and Co. Ltd. allowed the Society the use of their first floor space which proved admirable and adequate. The firm also gave very great assistance in many ways especially with publicity, their daily newspaper advts. being quite a feature and were much appreciated and contributed very largely to the success of the Exhibition.

Transport was well organised and the plants were carefully handled both to and from the Exhibition.

Many willing volunteers attended and helped with the receiving and staging of the exhibits and the many matters requiring attention.

Cymbidiums, as is usual in Sydney, largely dominated the Exhibition. Those who remember the pre-war shows will have noticed the astonishing advance in the standard of the blooms since those days, and the cultural improvement of the plants. Nothing in pre-war years was comparable with the quality of the exhibits or the size of the plants. An attractive feature is the fascinating variety of colours that have appeared, and the heavier type of flower that is being grown.

Many plants which already carried an Award of the N.S.W. Society were on show and several other exhibits being particularly noteworthy received Awards as follows:—

Awards of Merit (A.M. 1945).—Mr. T. Burns and Mr. C. C. Hilderbrandt, *Cymb. Louis Sander, Var. Kirribilli.*

Mr. A. R. Begg, *Cymb. Joy Sander.*

Highly Commended (H.C. 1945).—Mr. L. H. Newman, *Lycaste Skinneri, Var. Excelsa.*

Mr. W. Rothwell, *Cyb. Swallow, Var. Conquest.*

Mr. W. Rothwell, *Cymb. Shirley, Var. Her Majesty.*

Mr. E. A. Hamilton, *Erica Sander, Var. Tanandra.*

Visiting growers from Melbourne displayed flowers of the following Cymbidiums:

Lowianum (with leaf, petals and sepals variegated) *Ramboda, Ceres,* var. F. J. Hanbury, *Swallow* var. magnolia, *Sussex, Ruskin* and also the first prize-winning Cyprepedium from the Melbourne Show—*Gertrude West.*

Several plants that caught the eye were:

Cymb. *Irish Melody,* attracted considerable interest. (E. Usher).

Cymb. *Charm* var. Elegans.

Cymb. *Princess Elizabeth* (S. Shead).

Lycaste Skinneri, well grown, 8 nicely shaped large flowers (D. Hemming).

Cymb. *Carisbrook,* comes good every year. (L. Hawley).

......*Three good Cyprepediums* (W. Fahey).

Cymb. *Girraween,* batch of 6 different with nicely shaped flowers (C. Deane).

Cymb. *Pipit x Lowi-Eburneum* particularly admired by the ladies.

Cymb. *Athens,* Specimen plant, 9 large spikes, beautiful pink flowers (A. E. Hamilton).

Other varieties of Orchids were well represented too, and in order to encourage miscellaneous exhibits, the committee decided to issue medals and made the following awards:

Society's Silver Medal.—Mr. C. C. Hildebrandt, for an exhibit containing Cymbidiums of outstanding merit and other orchid plants.

Society's Bronze Medals.—Dr. A. L. Lyell, for a meritorious display of miscellaneous Orchids.

Mr. L. Sasso, for a large and meritorious exhibit of miscellaneous Orchids.

Many of the 48 exhibitors put forward excellent and interesting exhibits, and were responsible for a fine display which was very representative of the Society's members.

There was a good attendance every day, approximately 6000 paid for admission, and with the money raised by the Ladies' Committee by the disposal of plants, etc. gave a total of over £400, which, after meeting expenses, will give a net result of about £300 for the British Centre.

The public took a great interest in the plants. Much information was sought and given. The demand for orchid literature was very great, and quite unsatisfied, although an endeavour was made to cater for it, but this proved quite inadequate.

The Exhibition itself, and the ready answers to enquiries, was an education to an eager and growing band of Orchid lovers.

The opening ceremony was performed by Lady Jordan and representatives of the British Centre were in attendance. All expressed their appreciation for the splendid effort made by the Society for the British Centre.

Lady Jordan referred specially to the work done by the Exhibitors in bringing together such an attractive lot of plants and to the strong support of Messrs. Beard Watson in providing the premises and other assistance. She also said that it was fitting that the proceeds of this Exhibition should go to the British Centre as she understood that the majority of plants exhibited had been imported from Britain originally.

It was only necessary to wander among the throng, to realise the greatly increased number of interested people with a knowledge of the finer points of an Orchid flower and how to cultivate them. The Orchid loving public in Australia is greatly on the increase.

The Exhibition proved to be a very friendly reunion, everyone enjoying the happy spirit prevailing throughout.

And so the Exhibition of 1945 has gone. Many lessons have been learnt, and it is hoped that next year it will rise to even greater heights. One suggestion already put forward, is that future Exhibitions be open at night also, if that be practicable.

W.W.

Hasty Culling

● How many of us have got rid of really good Orchids because we judged them on the flower which they threw when growing unhappily?

This year I flowered Joy Sander Variety Magnificum, unquestionably one of the finest Cymbidiums in Australia, and one of the largest flowers. This year's flower was less than half the normal size, had only a fraction of the texture of a normal flower, and where the colour should have been a deep chocolate it was a yellowy green. The explanation is that a Sydney enthusiast persuaded me to repot for the second time to take off a bulb for him, leaving me with only one bulb. That bulb did not make proper root growth and shrivelled, and made only a weak growth and threw a flower spike from the base of the shrivelled bulb.

Readers should be very careful in culling a plant unless they have seen a flower from a healthy bulb. I have got rid of Cymbidiums through such hasty judgment and have been compelled to buy them back to keep them in my collection.

Another instance of the foregoing happened with a Sydney grower who was at my home one Sunday during the Victorian Show with a little plant in flower. The flower was so insignificant that I sold it to him for a token price. Another grower who had the same plant had it displayed in the Melbourne Show. My attention was drawn to it—a really beautiful Cymbidium, and after comparing notes we found that the one I had sold was the same variety. I have no regrets, we live to learn, but I would like to warn readers against the hasty culling of their plants.

R. BRUCE HOGG.

Denrobium, Gatton Belle.

● Grown by Dr. A. C. Burstal, awarded H.C. Certificate O.S. of N.S.W., 1945. Petals and Sepals rose pink, paler at the base. Fine large white lip with rose pink edging. Considered to be the most attractive dendrobium yet exhibited in Sydney.

Germination by Culture of Orchidacea

Petty Officer JOHN L. NORRIS, R.N.

Late Student of Kew Gardens and Stagaire Eccle d'Horticulture de C'Etat, Vilvorde, Belgium

● Your esteemed Editor, has prevailed upon me to give a short account of my experiences in this subject.

Working under the supervision of Monsieur Kessler, a brilliant Belgian horticulturalist. I had incredible results, even going as far as to state: Results 100%.

First, the solution:

Distilled water (1 litre)	1,000	grammes
Magnesium Sulphate (crystals)	0.3	„
Potassium biphosphate (monopotassium)	0.3	„
Ammonium sulphate (pure)	0.5	„
Magnesium citrate (soluble)	0.05	„
Agar (gelatine shreds)	16.0	„
Potassium Silicate (conde solution 30.33%)	.05	grammes
Calcium nitrate (pure)	1.0	grammes
Iron citrate (ferric scales)	0.2	„
Sulphate of potash	0.15	„
Phosphoric acid (pure)	2	drops
Miel (honey	30.0	grammes

Working in a laboratory, we had every convenience to hand, but there is no reason why the sowing could not be accomplished anywhere. Any chemist would weight off the ingredients for a small fee.

The Agar (gelatine shreds) should be first dissolved in the distilled water before adding the other chemicals, thoroughly mixing before and after boiling. Allow 10 minutes after the solution has come to the boil and then drain off into the bottles, 50 grammes or just over half an inch. Bottles are then securely plugged with cotton wool and placed in a sterilising machine, keeping the bottles upright. A heat of 123 degrees centigrade is maintained for 20 minutes. Remove bottles when they are cool enough to handle and place on a bench with the neck inclined upwards at approximately 30 degrees, leaving a good surface for sowing. Arrange two bunsen burners on a stand, one suspended vertically downwards, directly over the other, leaving a gap of about 3 cms. between each flame.

A solution of Calcoria chlorate (calcium hypochlorite) (lime-chlorinated or bleaching powder) is then prepared 11 grames to 140 ccs. of distilled water. The seeds to be sown should be immersed in the liquid. For Dendrobiums, sowing should be commenced after 5 minutes and fresh seed inserted in the hypochlorite solution after 13 minutes. For Cattleya and all other species commence after 8 minutes and finish at 10 minutes. Sowing should be accomplished as quickly as possible realising that the main object is to keep the culture solution sterile. Holding the flask, with the neck between the two bunsen flames, withdraw cork. By means of a glass-rod flattened at one end, take up from the hypochlorite solution a small quantity of seeds and passing them through the flame and bottle and sowing them on the surface of the culture.

This should be in a semi-solidified state and it is quite simple to make a liberal spacing of the seeds. Replace the cotton wool plug slightly burning it through the bunsen flames to make certain no foreign object is getting in and this bottle can now be removed from between the two flames. Allow to settle while the other sowings are carried out and then for additional safety, a small glass beaker with a layer of cotton wool is placed over the neck of each bottle; a paper-tab containing the data can also be inserted. The cotton wool should be securely pressed down between the neck and the flask with the aid of a stick. The bottles are then arranged out in a closed frame keeping the temperature at a minimum of 18 degrees and a maximum of 30 degrees centigrade.

Germination allowing for climatic conditions, should begin to show within three to four weeks and be ready for transplanting within eight weeks.

The seedlings are then treated in the normal way, a god start is to prick out five to each thumb pot.

● *Cypripediums*—Cypripediums are occasionally noted which make one new growth only each year and such plants consequently never increase in size. It is suggested that possibly more growths could be induced by preventing the plant from flowering one year and repotting into a large vessel and giving liquid manure during the growing period.

American Activities

● That famous Southern hospitality was truly "soaked up" by the Trustees and other Orchid enthusiasts in Chattanooga, Tennessee when they were entertained by Mr. and Mrs. Clint McDade, hosts to the American Orchid Society members for the quarterly Trustees' meeting. On Thursday evening, September 13, Mr. and Mrs. McDade entertained with a buffet supper at their home in Rivermont. Friday morning the Trustees' meeting was called, and about eighty people attended. Mr. Rodney Wilcox Jones, President of the Society, presided. Officers and Trustees were Mrs. W. K. duPont, Vice-President; Miss Edna Richter, Assistant-Secretary; Mr. R. H. Gore, Mr. Oliver Lines, Mr. Harold Patterson, Mr. George Baldwin, Mr. Louis V. Dorp, and Mr. McDade.

The Exhibit Table was filled with many fine Orchids from various parts of the country. Armacost and Royston of California sent a group of fine cattleyas, among them a very outstanding labiata. Mr. Ralph Kiesewetter, of Roslyn, New York, sent a beautiful bloom of a fine brasso seedling, Bc. Heather Queen X Lc. Hilary, F.C.C. Mrs. W. K. duPont's contribution was a very fine Vanda Coerulea, a spray of phalaenopsis, and a spray of Oncidium Varicosum. The Orchid Research Company of California sent three lovely sprays of phalaenopsis. Mrs. Samuel C. Porter, of Atlanta, Georgia brought with her a very fine plant of Cattleya S.C. Endicott. Mr. George Pring, Director of Missouri Botanical Garden, brought along a number of Vanda Tricolor which gave the entire Club Room a heavenly fragrance. Butterworth's of Framingham, Massachusetts received much favourable praise from their six Cypripedium Leyburnense Mag. and six Cypripedium Maudiae. Governor Gore, of Ft. Lauderdale, Florida, entered a fine group of Cattleyas. Blc. Phalida Magnifica was especially outstanding. Mr. F. O. Reh, of Belleville, Illinoise drew comment and admiration for his plant of Blc. Minpuss which was attractively grown in a hollow log. A group of Cattleyas was entered by Mr. McDade, and awards were received by his entries as follows: Cattleya Bow Bells variety Purity and Laeliacattleya Princess Ishtar were awarded First Class Certificates, and Blc. Malvern variety Grace and Cattleya Ethel Bishop variety Signal Mountain received Awards of Merit. A silver medal was awarded a group of five Cattleya Bow Bells.

John Lines is Mr. McDade's grower.

After the meeting, luncheon was served at the Signal Mountain Country Club and then the guests were invited to inspect the McDade Orchid range, Rivermont Orchids, and on Friday evening dined at the beautiful Chattanooga Golf and Country Club overlooking the winding Tennessee River.

Saturday evening the visitors were delighted with the spectacular Cotton Ball. This magnificent event is the Premier Social event of the South. Belles from all over the South covet an invitation to be presented at the King and Queen's Court at the Cotton Ball which is held each year in Chattanooga. The sixty Belles presented this year, were each dressed in white cotton. The dresses were fashioned with ruffled hoop-skirts, with dropped shoulders and tight basque waist. The red arm bouquets the Belles carried were made of cotton, and the white calla lilies the Cotton Ball Queen carried were of starched white pique.

Several years ago, Mr. McDade conceived the idea of having an Orchid Princess in connection with the Cotton Ball, and leading Orchid growers from all over the United States sent Orchids to be presented to the Belles and to all the young ladies taking part in the Grand March. Orchids were everywhere. It seemed that the rare and exotic Orchid was as commonplace as the lowly cotton itself.

Orchid Princess Eleanor Jones daughter of President Jones as she gracefully knelt before the Cotton Queen to be crowned Orchid Princess carried a beautiful cascade of various Orchids which contained cattleyas, phalaenopsis, oncidiums, dendrobiums, cypripediums, and cymbidiums. Miss Elizabeth Vaughn, attendant to Miss Jones, carried a lovely spray of Orchids tastefully arranged.

Little Miss Jean Ferguson, of Augusta, Georgia, one of the train bearers to Her Majesty, the Queen of the Cotton Ball, wore across her head, like a miniature crown, a spray of white phalaenopsis Orchids.

Orchids were sent from far and wide in order that the Orchid Princess might reign to splendor. (*See photograph, page* 84.)

● Imported plants frequently require two years and more to acclimatise and flower.

The John Bisset Orchid Show

P. A. GILBERT, *Lakemba, N.S.W.*

Announced as the 1945 Victory Orchid Exhibition, and held in Mark Foys' Empress Rooms, from the 19th to the 21st September, Mr. John Bisset's show was his biggest and best so far held. The excellence of the standard types of flowers, together with the assortment of species and hybrids, indicated a splendid effort and co-operation.

The show was in aid of the Kindergarten Union of N.S.W.

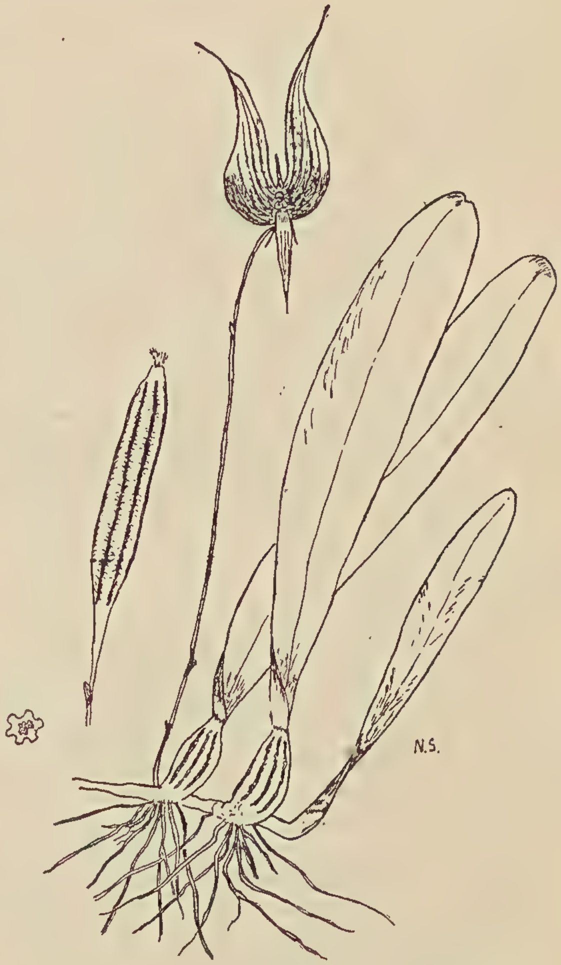
Cups and money prizes to the value of 180 guineas were distributed by Mr. Bisset to competitors, and flowering *Cymbidium* plants to the value of 20 guineas were donated as prizes for the "lucky number" competitions in aid of the Kindergarten Union.

Dr. J. A. Vote was the outright winner of the Black and Flory Cup; Mr. N. MacDonald is the holder of the Beatrice Stewart Cup for 1945-46; and Mr. F. Moulen won the John Bisset Cup for the champion *Cymbidium.*

The champion *Cymbidium* (C. x. Cassandra) compared favourably with previous champions, being rather a novelty in the almost entire absence of pigmental colour in the perianth, the flower approaching the condition of an albino. The sepals and petals were even in shape and size, the flower being round and saucer-shaped. The labellum was of medium size, prettily pitted—a departure from the conventional spoon-shaped labellum—which added balance to the over-all appearance of the flower. No part of the labellum was invisible through being recurved. It may be mentioned that *Cymbidium x Alexanderi,* var. *album* received a F.C.C., from the R.H.S.

The *Cymbidiums* generally were a very nice lot, both in regard to shape and colour, being a distinct advance in quality, showing that *Cymbidium* growers realise the importance of exhibiting the best. Dr. J. A. Vote (1st); N. MacDonald (2nd); C. C. Hildebrandt (3rd), provided a charming splash of colour in the Distinct Colour Section, while Mr. W. Fahey's *Cymbidium x Ceres,* var. *F. J. Hanbury,* "walked off" with the special prize for the most strikingly coloured *Cymbidium.*

The *Cypripediums* (about 30) were a particularly fine lot for this time of the year, the honours in the duel between Messrs. L. Sasso and W. Fahey being about even, Mr. Fahey, however, securing the first prize for the best *Cypripedium* with *C. x. Falstaff.*



COELOGYNE
Upper sepal a mechanism. Flower red-brown, fading towards tips. No scent.
Medang, Nov. 1944.

The *Dendrobium* and *Cattleya* sections were keenly contested with colourful types, and in the miscellaneous section, two *Odontoglossums* exhibited by Dr. Vote were noteworthy as horticultural efforts.

The Novice Section was very well patronised, which proved its popularity, Mr. F. Moulen taking first prize for the three best *Cymbidiums,* and the championship of the show, previously mentioned. Mrs. M. Stokes won the first prize for the best *Cymbidium,* and second in the group of three. Mr. G. Begbie came second in the best *Cymbidium,* and second in the class for the best specimen *Cymbidium* in the show.

Cypripediums

W. FAHEY, *Waverton, N.S.W.*

Most of the Hybrids have now finished flowering and only summer varieties remain to flower. It is to be hoped you have attended to those plants that needed re-potting, you will find by now they have made good roots and if you have managed this you are on the right track.

Now is the best growing period, so make the best of it. Make sure that the roof of your house is well shaded now, and on no account let the hot sun-light direct on your plants. I suggest if it is possible you shift plants from the hot house into a cooler position for the summer months; they will reward you for the rest and fresh air. Make sure you spray plants monthly and please do not forget to spray underneath the leaves as Mr. Thrip is a wily little fellow, he is awake-up to those growers who only spray on the top of the plants, so give him a good send-off by spraying underneath the leaves. I have found "Pestoxol" excellent for Cypripediums, about 15 parts to 1.

During the hot summer you can water the plants once a day for those plants potted in fibre and tan bark, and those potted in tan bark alone can be watered twice a day. Try and keep that nice damp atmosphere by damping down the floors well, and with good ventilation and overhead watering during the summer you will find that your plants will thrive, and in a few months' time these little plants will show their appreciation of the treatment you have given them and reward you with a fine flower standing up in all its glory.

It is pleasing to notice the added interest in Cypripediums of late and I think our little yearly sectional show has been largely responsible for this. For the growers of Cymbidiums only I would suggest securing a few of these plants and you will have a lot of fun while waiting for the Cymbidiums to come into flower; remember it is possible to have Cyps. flower in your house all the year. You only need a few of the summer flowing ones and a few Hybrids, and you must admit that speaks well for Cypripediums.

I was privileged this year to see the Cyps. displayed by the Orchid Club of Victoria; they surely had some fine quality plants and a credit to those who grew them. I would say the judges had no easy task in deciding the best out of the winner Gertrude West and another one named Breta Rotunda. Then again here in Sydney we saw a fine display of blooms on the bench, in fact I would say it was easily the best we have ever seen for this time of the year, and as interest increases in Cypripediums we will look forward to a feast of these flowers in future.

Pot Sizes

We have received much correspondence seeking information as to the size pot which should be used for the various main Orchid plants. Perhaps the following may be of value to Victorian growers who subscribe to the Journal.

Cymbidiums:

Small rooted back bulbs	4-in. pots
Large rooted back bulbs or severed growths	5-in. pots
Propagated back bulbs making their second bulb	6-in. pots
Plants with more than one fully grown bulb	8-in. pots
Large plants—Pots sufficiently large to allow 2 years growth without overlapping the sides of the pots.	

Cypripediums:

Small divisions	3-in. pots
Strong single growth	4-in. pots
Two growth plants	5-in. pots
Larger plants	6-in. pots

Cattleyas and Dendrobiums

Pots of sufficient size to allow 2 years growth by potting the plant with the back of the rhyzome touching the side of the pot.

Two years growth can be easily measured by measuring the distance between any two bulbs and multiplying it by two and allowing half an inch for safety. This is the only way to recommend pots for Cattleyas because some varieties send their successive bulbs up very close to each other while others cover quite an amount of pot each year with the growth of the rhyzome.

R. BRUCE HOGG.

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In order that the A.O.R. be fully representative of growers in differing climatic conditions of the Commonwealth, Orchid Societies in the States not represented above are invited to nominate a representative.

Flood Waters

(To the Editor)

● Here is the portion of my letter re the flood which you thought might be of interest to other Orchid growers.

On Sunday night, June 10th, we began to realise we were fairly in for a flood, as the rain came down in torrents without pause, and that added to the fact that the ground was already saturated by recent rains, was all that was needed to cause a quick rise in the river. Before dark, and in pouring rain, I did all I could to raise things as high as possible, as we live on the river bank, and have had our garden under water twice before, in 1921 and 1931. My car complicated matters by refusing to start, having been thoroughly wet coming home from Brisbane the night before, and I did not get it away until after dark. Others were not so fortunate and many cars were completely covered by flood waters before morning.

The Orchids were not so fortunate, and, except for a few Dendrobes I had brought in on to the verandah my entire collection was under water for from eight hours upwards. Those on the lower benches, and the Cymbidiums on the ground were immersed for at least 30 hours. We really had two floods, one on Sunday night, and a second one on Monday night, when the waters which had fallen about 2 feet, rose again, after further heavy rain, to within a couple of inches of the first level. The Epidendrums, five feet in height, near the garage were right out of sight, flowers and all, from the Sunday night until Tuesday afternoon. However, none of them has rotted off, and now that the mud-stained flowers have fallen, are as gay as ever. The only casualty so far is Vanda Coerulea, which had a spike of seven buds. The buds have damped off, and the centre of the plant is dying. Actually the others look none the worse for their experience. Some of the Cymbidiums in their stumps, were floating about on their sides, but, when righted, and the missing compost replaced, look as fresh as ever, with their new growths still developing. Surely such an experience demonstrates the hardiness of Orchids! Garden plants such as stocks and Iceland poppies were just pulp, and many shrubs died.

I had to take a small dish mop and a basin of water, and wash down all the leaves, as even the hose at high pressure seemed to remove only the outer layer of the slime that coated everything. A Lowianum in spike is just carrying on as if nothing had happened, and even Cattleya Trianae, which had an unopened sheath, has now produced perfect blooms. We were fortunate in having a couple of weeks of very mild weather while things were so wet, and no frosts.

The garden is a wreck. The two Camellia bushes look very queer with the pure freshness of the flowers contrasting with the muddy foliage of the plants which were under water.

We had four feet of water under the house, with a depth of over five feet at the back gate. Our fences are high, with palings not too closely set, so, allowed the water through, and were not washed away, they also served to prevent things washing out of the garden, and also kept heavy rubbish from coming in. But I'll never forget the mud! A thick layer of grey slime over everything, which a few days later became gluey mud, and later, fine dust rising whenever one touches grass or plants.

Yours sincerely,

(Miss) K. McILRATH,
Murwillumbah, Tweed River, N.S.W.

Dendrobiums.

● Be sure their potting material is firm and wholesome; never soggy or broken down. Renew it regularly.

"Jungle Juice"

D. W. PETHERBRIDGE

(A number of very fine drawings of New Guinea Orchids, drawn to scale, accompanied this article, one of which we publish herewith. —Ed.)

● On service in New Guinea and whilst not engaged in operations, the War becomes just as boring as it does on the mainland. So, the boys look for some distractions from military duty. We are all instructed on the fruits and growths in the jungle—those we may use for food, water and rope; also, as a security measure, some of those which we must not eat, due to the poisons they contain. Any soldier interested in the ways of nature is indeed fortunate, for in the jungle he finds his distraction, sometimes his dismay, in the great number of new fruits, edible nuts, rope vines and other jungle life. Also he finds all manner of strangely growing plants which arouse his further interest as to their identity, their uses and their place in Nature.

Members will perhaps be interested to read of some observations made in the jungle under these circumstances and I shall try to give a glimpse of the immediate vicinity of Madang, New Guinea—with regard to its climate, plants to be found there and pieces of local colour.

The climate is one of the most important subjects and I divide it into five aspects, all of which have some bearing on plant growth, namely Seasons, Winds, Rainfall, Temperature and Humidity.

Seasons and Winds.—The NW season, mid November to end March, is a season of violent squalls with overcast low cloud and heavy rain alternating with periods of fine weather. The SE season, mid May to end September is a season of minimum cloudiness. Rain falls mainly in the late afternoon or evening. Throughout the year, winds blow from offshore during the mornings and from onshore during the afternoons. The winds are lightest from April and strongest during October. Squalls occur in any season but are of short duration—there are no tropical cyclones.

Rainfall.—The rainfall is heavy. The maximum is in the Doldrum months (April-May) (October-November), when monthly totals are from 14 inches to 17 inches; the minimum is in the SE season (May-September) when monthly totals are from 5 inches to 10 inches. Rain falls generally between 6 p.m. and 2 a.m. (about 3 times as much as during the day). The maximum fall recorded in one day is 10.27 inches.

Temperature and Humidity.—There is little seasonal variation. The relative humidity is always high but shows a decrease of about 7% to 11% from morning to afternoon.

The climate is therefore of persistently high temperature and humidity and there is little respite during the year. The range between day and night temperatures increases inland and at higher altitudes. Sunrise and sunset vary little more than half an hour the year round and the climate is quite monotonous.

From these climatic conditions I have tried to define the three seasons of Orchid life—Growth, Maturation and Flowering. I have found in the area, Dendrobiums, Vandas, Renantheras, Phalaenopsis, Coelogyne, Bulbophyllum and Phaius. Most of these have different seasons of course, but in spite of this, the only conclusion I ca ndraw is that the seasons are approximately the same as on the mainland, but the climate is "stepped up" and naturally favours growth of the Genus' named (especially Phalaenopsis) with its minimum annual temperature of 75° F. and high humidity.

But how do these figures compare with the conditions in our Orchideries? Here is our problem! Only in a large glasshouse can these conditions be copied and yet provide the necessary ventilation. Most of us prefer to grow the plants at much lower temperatures in the hope that they will become more and more accustomed to our natural conditions and finally perhaps grow and flower without supplied heat.

Then there are the earth tremors! These always bring to light some wit in the camp. On one occasion during a tremor, one of the boys woke with a start and yelled to his tentmates:

"Hooray, my 'homer.' The nervous breakdown I have been expecting has come at last!"

On another occasion, an officer promised to move Heaven and Earth to get some new gear. There was an earth tremor that night—but no new gear in the morning!

Jungle wandering is a stupid pastime and the boys do not indulge unless there is a paw paw or banana grove to be found. It is very fatiguing, the stench is strong especially in swampy parts—and it is quite hard enough to ward off skin complaints and other diseases when in camp, without looking for further trouble. There is always the chance of coming across Orchid growth, however, in the belts of jungle surrounding the gardens, or on trees which have been knocked over by shell fire, or again, on trees overhanging creeks along which we paddle in our Lakatois. And so I describe those I found.

I was most pleased to find Phalaenopsis—as the climate seemed to favour them. They were all of the same variety and very poor of flower. The spike was up to 18 inches long with about 20 small flowers which had a short life and which never opened. They were, when forced open and broken, a creamy colour flecked with red. However, I was satisfied to see these plants growing in their natural state. They were always on the moss-covered trunks of trees carrying a heavy canopy of leaves, so that the plants did not get direct sunlight; and they grew in profusion. Then there was a large tree knocked down similarly covered with plants, but as the tree had fallen into the sunlight all the plants were yellow and doomed. Mingled with the larger plants were countless numbers of seedlings from fingernail size to matured plants. This area is truly their home.

The Renanthera was a very hardy specimen. One plant grew in a dead tree (white ants did it) with only the bare rotten limbs standing; yet this large plant grew from the lower fork, with numerous side growths, to the tops of the branches—about 20 feet—in full sunlight. The flowers were smaller than, but of the same shape and colour as Imshootiana and on very large branched spikes. Another smaller but very healthy plant lay fallen into a bunch of vines from where it had adventurous roots feet long seeking some secure hold. This plant received no sunlight.

The Vanda, I found purely by accident—the tree had been blasted and I almost fell on it reaching for a paw paw! It was a broad-leaved species, but I do not know its flower or name.

The most interesting plant found was a Coelogyne—a smallish plant with 1 inch bulb and 5 inch or 6 inch single leaf and having a small flower approximately 1½ inches. The two side petals curved upwards and outwards from the side of the flower in the shape of a lyre. The upper sepal was very small and operated as a trigger—as when the centre of the flower was touched with a small stick—that sepal darted forward across the stick in the same manner as the little Trigger plant of the Australian bush. (*See illustration, page 73*).

Two other Coelogynes were of "botanical interest only"—one being a very miniature species—bulb and leaf being about 3 inches overall, with tiny ½ inch white flowers. The other was a long leathery-leaved plant with small bulb, which carried a 15 inch spike with about 20 small white ¾ inch flowers.

Several Dendrobiums were found. One I am sure was a variety of D. chrysotoxum. The plant was similar in all respects—the flower spike similar and same size—but the flower was a greyish-pastel colour with red markings on all members. Another was of growth similar to, say D. superbiens—pseudo bulbs up to 5 inches in length and it flowered along the whole length of the bulb—¾ inch creamy flowers appearing in pairs from each leaf node. It made a good show—for two days! A plant similar to it, but with soft, grass-like and pointed leaves was not seen in flower.

Another Dendrobe with very slender leads and few leaves was a very poor, weakly growing specie and was passed on lots of occasions until observed in flower. It carried ¾ inch flowers in pairs—but of a heavy texture and of mottled cream and rose colour. The seed pod of this plant was unusually large—the side of a pullet's egg. When opening, the pod split into 6 ribs still joined at the tip—the thousands of seeds spilling out when moved.

One Dendrobe I thought was perhaps "Stratiotes" from a photograph of that variety I had seen. The plant grew like D. undulatum but the long pseudo bulbs were streaked heavily with red below each leaf node. The flower spike was large—I saw one spike of 17 flowers each approximately 2 inches across. The flower was yellowish but streaked, the labellum was good, frilled, edged and veined with deep purple .A fine plant.

The last Dendrobe resembled D. coelogyne in its growth. The bulbs grew at intervals on a long rhizome, with very leathery leaves. The roots of this plant came from each side of the rhizome and although numerous were only sufficiently long to attach the plant to the tree. One plant I saw growing happily—a plant about 4 feet long—merely entangled in a jungle vine. The flower was good. It flowered singly on a stalk which came from either the base of the bulb or from the rhizome itself, between the bulbs. The flower was approximately 2½ inches across, full and well formed—cream, spotted bright rose. Another plant had greenish flowers similarly spotted rose, and was very heavily scented—sickly sweet. The flowers faced skywards, that is, inverted normally, but when the plant is growing beneath a branch, the flower was not inverted. If this plant were D. coelogyne, then it should certainly not be grown in a pot or basket.

Further inland among the hills, there was a large bulbophyllum with angular bulbs and leaves about 2 feet 6 inches long on a tree overhanging a creek where we stopped for a brew. A native had no idea what it was, but indicated by a Minora razor blade that it had yellow flowers and about 3 inches across.

Growing in the wet soggy mulch on a hill-slope about 1-in-1 (don't I remember!) I found the only terrestrial I had seen. A Phaius, with a spike of pink striped flowers about 2 inches across with deep funnel shaped labellum. This plant had had a bulb cut off at the ground. I asked a native:

"What name belonga this fella?"

"Him Pus Pus," was my answer and he wanted to prove it to me by cutting off another bulb, but I wouldn't have it. I could not savvy "Pus Pus" but he insisted and indicated him arm to me. I thought it could be a juice for repelling mosquitoes, a dye for "sing sings" or amedicant for scratches.

There could never be space enough to describe the other numerous and interesting plants to be seen in the area. Some of the long vines hanging 40 feet and more from tall trees had very beautiful flowers; great clusters of pink flowers, others with heavy wax-like flowers each 6 inches across, others of brilliant red flowering along the whole length of a vine festooning the trees.

And then the Punga Punga Lily which flowered near camp. It was a huge flower growing out of the ground and about 12 inches high and 15 inches in diameter and of very heavy rubber-like texture. This flower is named after its reputed odour, but that I saw was quite odourless.

Then there was the Sensitive Plant—a ground bush with mauve or white Wattle-like flowers and complete with thorns. The leaves of this plant when touched, immediately folded and hung limply down to the ground, leaving only the bare stalk and thorns for its tormentor. We tested this plant and found that the leaves took 5-7 minutes to re-open and as there were large patches of this plant growing in some cleared areas, we realised what a mistake it would be to cross it on a patrol.

I have not mentioned paw paws, coconuts, limes and bananas yet—but they are a different story! There are the Betel Nut Palms and Galip Nut Trees (excellent roasted), then a large coastal tree, a species of Calophyllum which the natives appropriately call "Kalipilim." I often wondered whether it is from the fruits of such a tree that other natives in the Indies prepare oil for lamps.

It was rather funny trying to find the names of jungle growths from the natives. They knew Kalipilim. The Mangrove is merely "dewai along water" (tree near water). They are only interested in trees and plants which they can turn to some advantage. For instance, "dewai nothing" is a useless tree, not used for anything. I asked a boy the name of the Phalaenopsis flower I had and he called it "palowa," then another called it "pul pul" which I knew as "flower" and I realised the first boy was only trying to say "flower." They told me that it grew "along dewai" and were most uninterested.

Then I showed a native a large Dendrobe about 3 inches in length and asked "name belong this fella" and to my surprise was told:

"Him fella Pus Pus." As before, I could not savvy pus pus—(it certainly was not in any pidgin book). I was however to be satisfied—for suddenly the boy turned to his mate and said:

"Him fella Pus Pus"—indicating a band of plaited fibre the other native was wearing on his arm. Then I knew—these boys only know the plant for what it can be used and they take the bulbs of these plants, dry them and with the long strings (for they are very fibrous) make these arm bands, staining them with various dyes for colour. Then they name the plant "Pus Pus" after the arm band, not perhaps as we would—name the arm band after the plant! And so I gave up trying to find the names of Orchids from the natives.

I hope that this article will be of interest and perhaps provide a little food for thought and discussion among members. Perhaps my inability to name the species will even help interest!

Carrington H. Deane's Annual Show

● Always an attractive Show, Mr. C. H. Deane's Orchid Exhibition held on 26th, 27th, 28th September this year was well up to its usual standard.

Messrs. Anthony Horderns Fine Art Gallery where the Show was held makes an admirable setting for the plants and the many fine quality blooms exhibited were shown to advantage.

As no report has come to hand details of Exhibitors and Awards are not available.

Brief Summary of Ten Years

J. SHAW, *Evan's Head, N.S.W.*

● The interesting articles by Mr. A. J. Daley and Mr. R. Bruce Hogg in the December issue of the *Review*, and other interesting observations in previous issues, prompt me to pen a few of my own observations.

I have been interested in this excellent hobby for a long period, but shall confine all remarks to my present home, which has a large, glass-walled, lath-topped bush-house, completely shielded all round from any draughts; but has a fairly open top of 3 inches by 1 inch battens, 3 inches apart. The top half is shaded by a large custard-apple tree, and an edible fig and a large mango, which interlock into a canopy; thus no roof is needed. This arrangement gives me almost a tropic well. I have a large fish pond in the centre, and benches and rockeries all around. The floor is black soil, which holds the moisture, the paths are gravel. The lowest temperature I have yet recorded at 6 a.m. was 40 degrees F., despite the fact that 200 yards away there was a white frost, and on one occasion, during the heat wave of 1936, the temperature recorded an even 100 degrees F., which I promptly reduced 10 degrees with the lavish use of the hose.

Now to successes and failures. All plants which have been with me for over ten years, or the greater part thereof: *Cypripedium*—I have only species such as *C. insigne, C. glaucophyllum, C. venustum, C. villosum, C. callosum, C. Parishii, C. niveum var. alba, C. bellatulum, C. Fairieanum, C. Charlesworthii*, etc. All are still with me—they are steady, fairly healthy, and all bloom regularly—in fact, one of them at least is always in bloom. They are grown close to the ground in the shadiest part. I cannot lay claim to luxurious growth, and feel that at any neglect as to watering and potting regularly they would leave me.

Selenipedium Schroderae, the only one of this group, grows well, but has never bloomed.

Dendrobiums.—My list includes *nobile, chrysotoxum, Parishii, Hildebrandii, Phalaenopsis, superbiens, superbum, Dalhousianum, Pierardii, gracillimum, chrysanthum, aureum, aggregatum, thrysiflorum, cruentum, formosum giganteum, suavissimum, fimbriatum, primulinum, moschatum, fuscatum*, and quite a few Australian species have all stayed, and done well. Most bloom regularly, but some fail occasionally. Failures include *Farmeri, Wardianum, crepidatum, draconis*, and *infundibulum. Wardianum* and *draconis* lasted two to three years, and bloomed quite well. *Falcorostrum* will not stay with me—far too hot, I think. *Smilliae* and *Tofftii* also departed.

Cattleyas all have done well, and whilst I cannot claim the growth of Townsville and North Queensland, I get good flowers and regular growths. These are to me the safest of Orchids. In fact, I have lost none, with the exception of two plants I was too anxious to subdivide, and a few sickly and neglected specimens which I have had given to me or bought from time to time to try and rejuvenate.

Vanda: *Suavis* and *tricolor* are excellent and regular; in fact, they seem to be nearly always in bloom. *V. coerulea*, two specimens bought from India nine years ago and potted identically and side by side all that time—one plant bloomed the first year, producing three sickly dark blue flowers about 2½ inches across on a 6-inch spike. It missed next year, making good growth, and the third year a 3-feet spike with sixteen 3½-inch flowers; and the plant has never failed since. The plant has not made any extra growth to speak of, but has not gone back, but the flowers have become paler in colour each year, till now they are almost white. The other plant is much healthier, strong and vigorous-looking. It bloomed the second year, carrying four fair-sized flowers, but has not bloomed since. I cannot understand it. *Vanda Parishii* and *V. Parishii var. Mariottiana*, also side by side, over the same or a longer period have made wonderful growth, excellent roots, and are remarkable plants. *Mariottiana* blooms every year without exception; in fact, it has bloomed twice in eighteen months. *V. Parishii* has never bloomed, and I cannot make it. *Vanda Batemanii*, a huge, strong plant, never bloomed. *V. teres* hangs on, but only just, has bloomed twice, and is right out in the sun. *V. amesiana* lasted two years, no bloom. *V. Sanderiana*, a very poor plant purchased in North Queensland, slowly went; I could not make it pick up, but intend to try it again. *V. Boxallii* also went. *V. Kimballiana* is still alive, but no better than when I got it, no bloom. *V. Roxburghii* still with me, but only just.

Aerides crassifolium, A. falcatum, A. odoratum, and *A. multiflorum* all do well, strong growth and regular flowerings, as also do *Rhyncostylis retusa* and *Saccolabium giganteum.*

Cymbidiums I cannot grow, and apart from local species have never succeeded in blooming an imported one yet. I have only species—*giganteum, eburneum, Lowianum, Traceyanum,* and *insigne.* They grow very, very slowly, and I have tried all sorts of conditions and composts over that period without results; not cold enough, is my conclusion, so am chary of trying good hybrids; but I admire this species very much.

Calanthe, Veitchii, and *C.* x *William Murray* do very well, as also the local *veratrifolium.*

Epidendrum.—Obrienianum and *E. Boundii*: I started with a small shoot of each, have given away hundreds of plants, and now have a thick border all around two sides of the fernery three to four feet high, and a mass of blooms.

Phaius (*grandifolius*) *Tankervilliae* and *P. Mishmensis* do well, and bloom every year, but I do not treasure them as handsome Orchids.

Phalaenopsis amabilis, P. Schilleriana, and *P. Rosenstromii* all do well, and have never given any trouble or worry, blooming regularly.

Stanhopea tigrina: Excellent, no trouble, and a good bloomer.

Thunia Marshalliana and *T. alba.*—Only *alba* left, and have come to the conclusion that it is not worth the bother of cultivation.

Renanthera Imschootiana blooms regularly, and I like it.

Oncidium Sphacelatum and *O. splendidum*: The latter bloomed and has practically departed. The former grows and grows, but never blooms. I have seen some good *Oncidiums,* and intend to get more and try them.

Lycaste.—I have none, but intend to try them also.

Coelogyne cristata, the only one I have, did well for two years, then went back, but lately looks like coming good; bloomed last year, and I like it.

This, with a few odds and ends, comprises my collection. The whole are growing in a jungle atmosphere of plants and basket ferns, Polypodiums, Lycopodiums, Anthuriums, Philodendrums, staghorns, and elkhorns, etc.

I have dilated at large and perhaps boringly, but it is with the idea that it may prove a guide to some beginners, also the hope that others will offer suggestions for the failures, and think if more members can be persuaded to describe their collections, conditions, and experiences, it may help all of us along the right track.

Having been in the R.A.A.F. service for the last four and a half years, and only getting home at intervals on leave, you can guess the feverish activity of repotting that takes place. My good wife has had charge of the fernery the whole of this time, and has done remarkably well. I have not lost my original enthusiasm, and do not think I ever will. I have travelled from Adelaide to Cape York in that time, have seen quite a few good collections, and learnt quite a lot, besides making many friends. I am now longing for the end of the war to resume where I left off.

● What is your favourite Orchid? How do you grow it? Readers would like you to tell them. Short articles are required by the *Australian Orchid Review.*

● *Zygopetalum Mackayii.*—The two large specimen plants shown were splendid examples of this most unusual flower. The larger one, in a nine-inch pot, carried six spikes and forty particularly good flowers. A spike to each new undeveloped growth. One plant was grown in the cool glasshouse like a Cypripedium, and the larger one in a fibre and leaf mould mixture in the open with the Cymbidiums. The plant is a gross feeder with large roots, and requires a large pot. When grown under glass do not allow water to remain in the new growths, as rot will quickly develop. Although the genus is a large one, and contains many handsome varieties, we seldom see grown here any variety other than *Mackayii.* The variety is a native of Brazil, and admirably suited to the amateur cultivator. The flowers are perfumed and carried on an erect flower stalk. The pseudobulbs are ovoid and about three inches high, and the leaves 12 to 18 inches long. Sepals and petals are pale green, with brownish-purple bars; the lip is large and flat, the colour being white with violet lines. —*Extract from Monthly Notes, Orchid Society of N.S.W.*

The Orchid Society of N.S.W.

The new Executive elected at the October meeting of members is as follows:

President: Mr. E. A. Hamilton.

Vice-Presidents: Mr. L. F. Hawley, Mr. W. Rothwell.

Hon. Secretary: Mr. T. H. James.

Hon. Treasurer: Mr. J. Bisset.

Hon. Asst. Treasurer: Mr. W. Fahey.

Hon. Editor ("*Review*"): Mr. W. Worth.

Hon. Librarian: Mr. A. B. Porter.

Committee: Messrs. A. R. Begg, C. Cambourn, F. Douglas, K. Kirkland, R. Richards, L. Sasso, F. White.

Dendrobiums

J. GORDON SMITH, *Brisbane, Q.*

The genus *Dendrobium,* probably the largest in the Orchid world, is found in many countries extending from Northern India through Burma, the Philippines, Malaya, Java, New Guinea to the Pacific Islands and the east coast of Australia. Having such a vast range of habitat it is naturally variable in habit and consequently presents some very interesting features.

We are fortunate in that we have a good number of species growing in the coastal area from Cape York to northern New South Wales, and a number of these such as *Dendrobium Phalaenopsis, Superbiens,* etc., attract world-wide attention.

Now let us examine the natural growth of the *Dendrobium* from seed. The bloom having been inoculated, a seed pod is formed. The pod ripens, bursts, the seed, being dispersed and carried by various agencies, become lodged on the bark of a tree or other suitable host and germination takes place. A small pseudo-bulb, about the size of a small pea appears with a pair of tiny leaves and a few very fine short roots; the following years the pseudo-bulb is about three times the size of the previous one and the roots can be seen plainly, firmly attached to the bark. At 4 years the bulb is 8-inches to 9-inches high, and so growth goes on till the plant is strong enough to bloom. This is the normal life of a *Dendrobium* from seed in one of our northern rain forests.

The word "*Dendrobium*" is derived from dendron, a tree, and bios, life—which indicates that the genus grows on trees; generally speaking they do, but as mentioned previously they are variable in habit, consequently we find those dendrobes which prefer other hosts to trees.

Dendrobiub Kingianum, Speciosum are found on the New South Wales—Queensland border growing on rocks North of Cairns a few years ago, *Denrobium Phalaenopsis* var. *Compactum* was discovered growing on rocks and its short stout pseudo-bulbs seem to suggest that it has lived on the rocks for many years.

Dendrobium Undulatum is perhaps the most variable of the dendrobes and presents some very interesting features; it grows abundantly along the coast and on the islands north of Rockhampton. It does not appear to be in the least particular as to where it grows or the type of tree it uses as a host. Some years ago in the Mackay Gardens a number of *Dendrobium Undulatum* seedlings appeared on a Camphor Laurel tree and when I saw them last they had just about reached the flowering stage. *Undulatum* also grows in the ground in the full sunlight on the foreshores where at times it must be drenched with salt water spray, yet under these conditions plants can be found with pseudo-bulbs nearly as thick as a man's wrist, and often 8 to 9 feet high, growing in colonies.

These few facts all of which occur in our own State will serve to show you that dendrobes are indeed variable in habit.

Regarding compost, a mixture of osmunda fibre and sphagnum moss or fibre and peat is generally used, but in Malaya we find that the culture for *Dendrobiums* is very different.

I quote from "*The Malayan Orchid Review,*" April, 1940:

> "In pot culture, the best compost is considered to be a mixture of four-fifths newly broken house bricks and one-fifth clean fresh charcoal with a little tree-fern fibre added. Experiments with slightly charred wood as the base have proved quite successful. The plants show a distinct liking for the charred outer coating of the wood, the roots creeping and nestling in along the cracks."

It would appear from these facts that provided you can produce the right conditions in heat and moisture, *Dendrobiums* will grow in almost any compost.

Clear photographs suitable for reproduction are required by the *Australian Orchid Review.*

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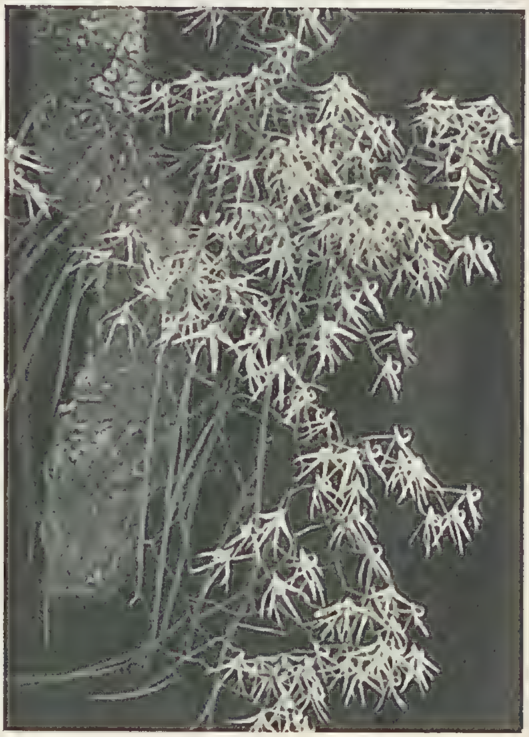
The Experiences of Three Members of the Orchid Society of N.S.W.

Mr. Gosper described his early importations of Orchids from India and Burma. He remarked on the length of time that many Ochids take to die and considered that a successful grower should be able to show plants at the end of three years better than, or at least as good, as when obtained. He added that he still had in his possession two plants, one of which was obtained 50 years ago and another, 40 years ago, neither of which had yet flowered, but he still had hopes. He offered an interesting method of getting rid of ants. Remains of chop bones are a great lure for ants, which swarm on them and could be brushed off into boiling water. He said that when arsenic and other baits were used, the poisoned ants had time to tell their mates, whereas with the chop bones, they were unable to do so and consequently fresh ants kept arriving on the scene.

Mr. Hayes said his first interest in Orchids was aroused by reading a story of Orchid Hunters in the Boys' Own Annual. He described the various plants he obtained and the results from them. Among his later acquisitions were *Odontiodas* with which he has had considerable success (as evidenced by his exhibits at our meetings). These are grown in a mixture of Todea fibre, tan barp and leaf mould. He once tried fertilisers, but the only visible effect was to kill the sphagnum moss.

Mr. Worth advised all new growers to "Look and Listen." Ask questions, all are willing to help. Everyone requires a hobby—but it should be a recreation and not a labour—and Orchids are a very fascinating one. Personally he was losing interest in *Cymbidiums.* The best specimens of *Dendrobiums* he had seen were grown outside. He was satisfied from observation and experience that *Cattleyas* could be grown in and around Sydney without artificial heat during winter. Principal factors for success are plenty of drainage and aeration, clean leaves and a realisation that watering is governed by nature of compost and growing conditions. He introduced quite a new subject in Orchid culture, viz., water propagation of epiphytes. He exhibited sections of *Cattleyas* and *Dendrobiums* rooting and shooting in water and many well developed plants subsequently transferred to usual compost. The procedure is to cut off back bulbs, old or otherwise, allow the cuts to dry for a few days and then place them in a wide neck bottle or glass jar filled with water. The operation should be done in Spring. If such plants can be brought to a certain stage in water, the possibility exists of bringing them to maturity under the same conditions.



DENDROBIUM TERETEFOLIUM

Growing on a section of the branch of Casuarina glauca (swamp oak) on which it was found by Mr. B. Parry-Williams at Sussex Inlet, N.S.W., three years ago. The plant is over 2 feet across. Old rhizomes were removed in February this year, the plant responded immediately with a lot of new growth.

Xmas Meeting

It has been decided that the Xmas Meeting shall take the form of a social gathering to be held on Friday, 21st December, at "Bellhaven," Parramatta Road, Burwood, at 8 p.m. Many members are familiar with "Bellhaven," having attended two annual functions there arranged by Mr. Bisset.

In order to defray expenses a number of Orchids were donated and were auctioned at the November meeting.

THE KING AND QUEEN'S COURT.

Orchid Princess Eleanor Jones carries a cascade bouquet of Orchids—5th person from left—back row. Little Miss Jean Ferguson—grand-daughter of Mr. Clint McDade—was a train-bearer and is seated on the right side front row, with spray of white phalaenopsis in her hair.

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The Orchid Society of N.S.W.

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WARRAWEE, N.S.W.

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Hon. Editor:
W. WORTH
4 Ward Street
WILLOUGHBY, N.S.W.
Phone: JA1533

The dates of the next meetings of the Society are as follow:

THURSDAY, 31st JAN., 1946 THURSDAY, 28th FEB., 1946

The Queensland Orchid Society

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His Excellency, Col. the Rt. HON. SIR LESLIE ORME WILSON,
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G.P.O. Box 2002 X
BRISBANE

Hon. Treasurer:
E. J. BEARD
381 Queen St.
BRISBANE

The dates of the next meetings of the Society are as follow:—

FRI., 14th DEC., 1945 FRI., 11th JAN., 1946 FRI., 8th FEB., 1946

Meeting Place: Miniature Rifle Range Building, Boundary Street, Brisbane. Meetings held on the Second Friday of each month. Visitors are welcome.

The Victorian Orchid Club

Meets on the third Monday in each month (January excepted), in the Australian Church Hall, 15 Russell St., Melbourne, at 8 p.m. Prospective members welcome.

The dates of the next meetings of the Club are as follow:

MON., 17th DEC., 1945 JAN., no meeting MON., 18th FEB., 1946

President:
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CANTERBURY, E.7.
'Phone WF2365

Vice-President:
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W. Worth, Hon. Editor.

Looking Toward 1946

Our quota of plants for sale during the 1945 season is entirely exhausted.

If things go well this winter, we expect to have ready for delivery next spring a greater variety of plants than ever before.

This will include new seedling crosses, back bulb divisions from our stud and exhibition plants, and a few adult flowering plants for amateurs who want a maximum of flower production at minimum prices.

Offerings will be confined principally to Cattleyas and allied genera. Inquiries should reach us any time after March 1, 1946. Southbound shipments will start about April 1. Northbound shipments about May 1.

*

We understand that regulations will not permit us to ship plants to Australia at this time. This advertisement, which is a duplicate of advertisements appearing in the American Orchid Society Bulletin and other Orchid publications, is reproduced here just to remind our Australian Orchid growing friends that we are still doing business and growing seedlings.

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